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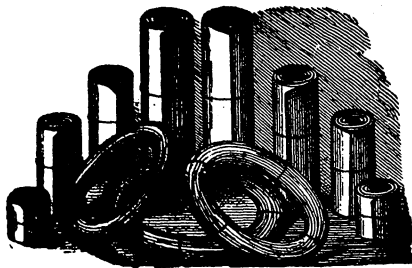
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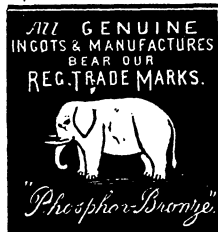
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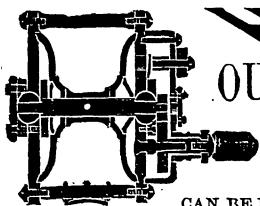
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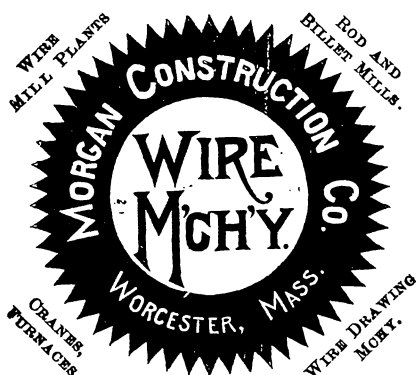
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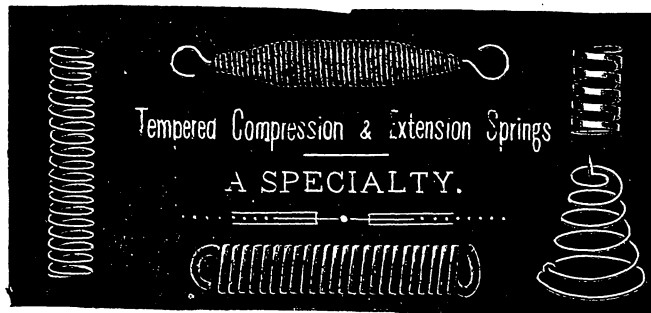


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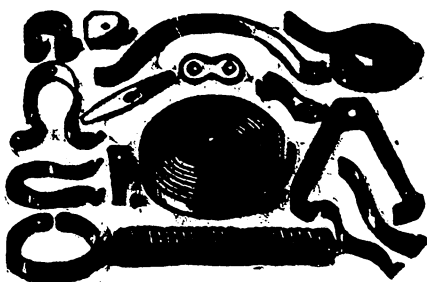
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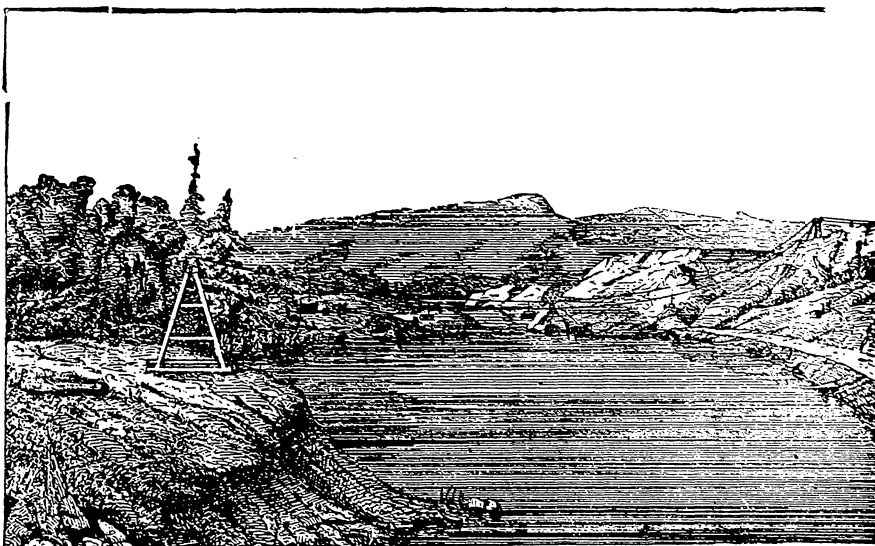
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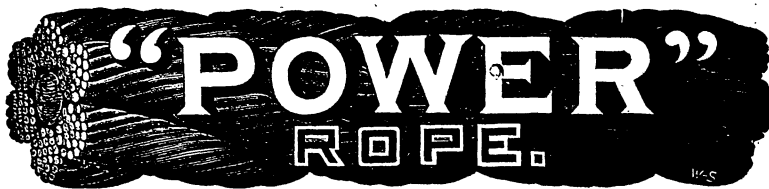
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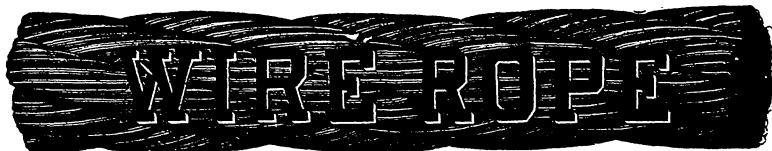
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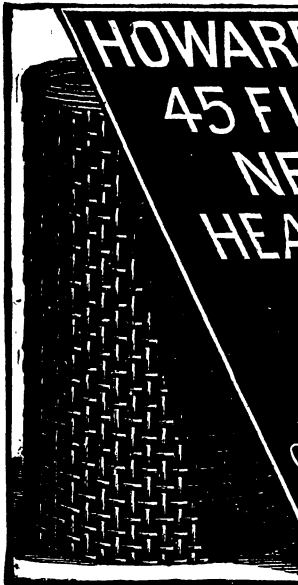
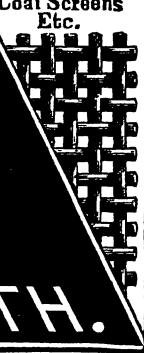
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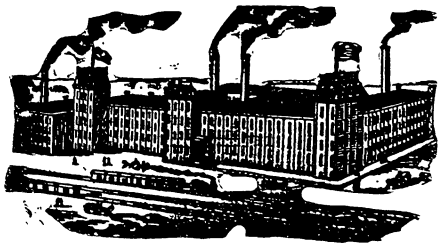
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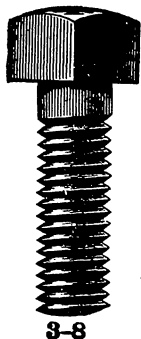
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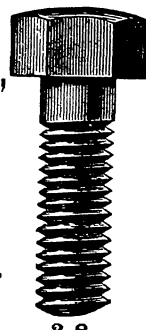
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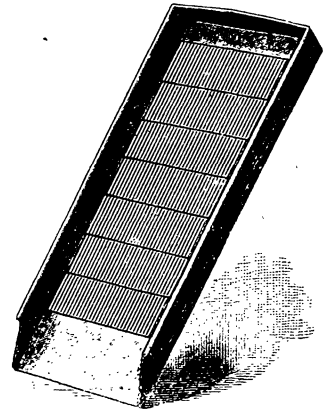
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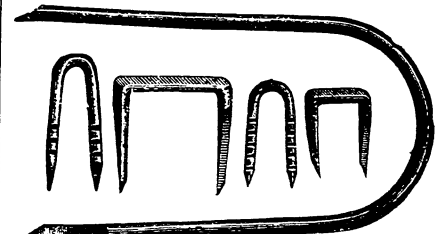
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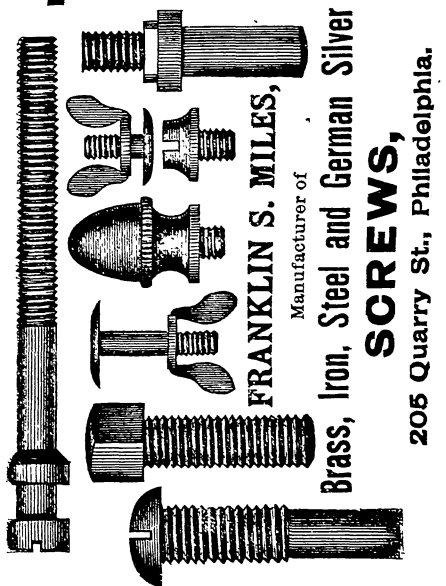
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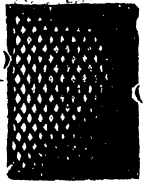


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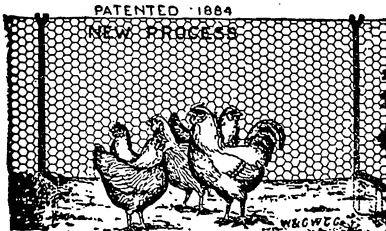
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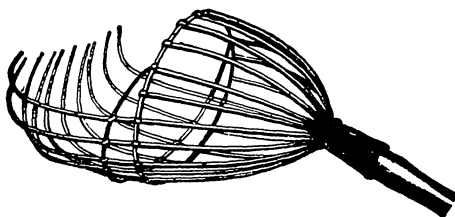
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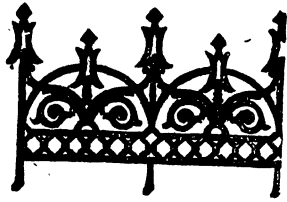
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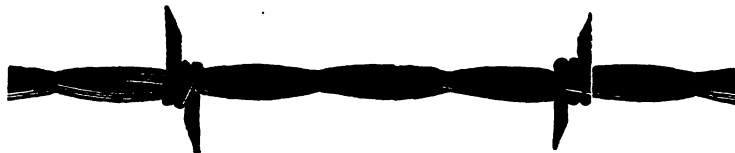
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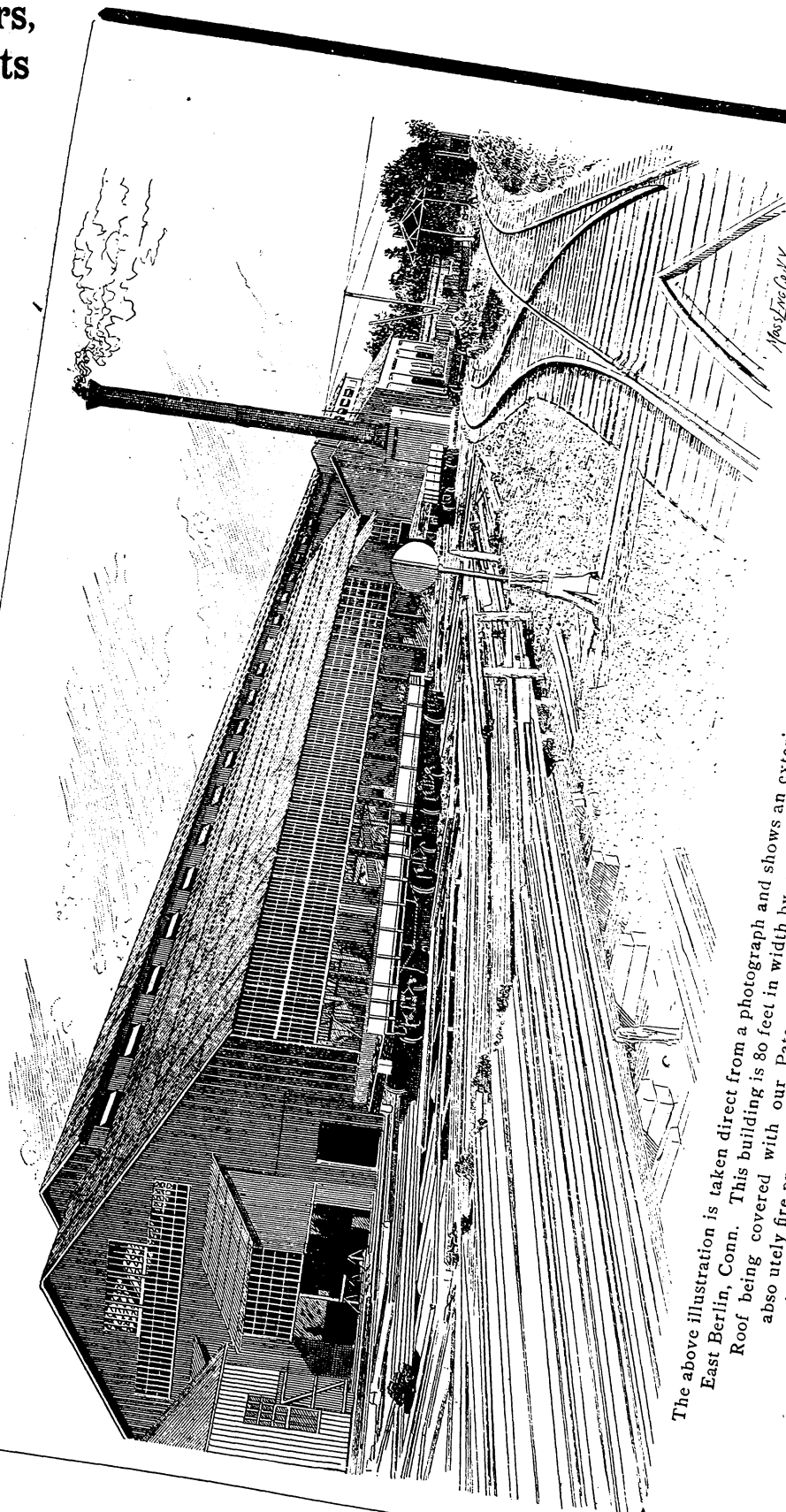
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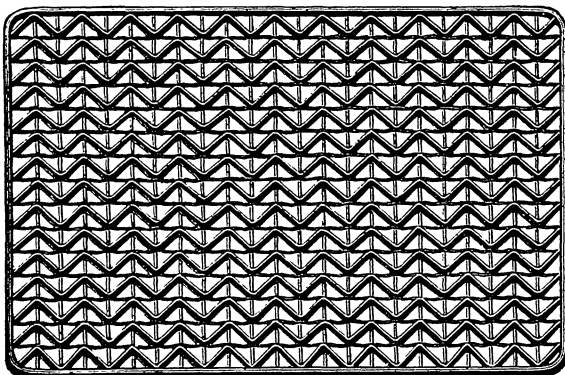
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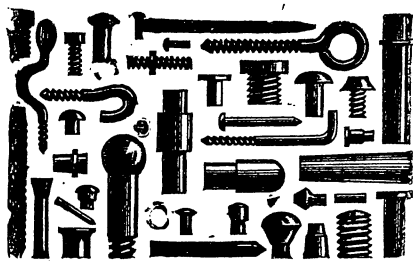
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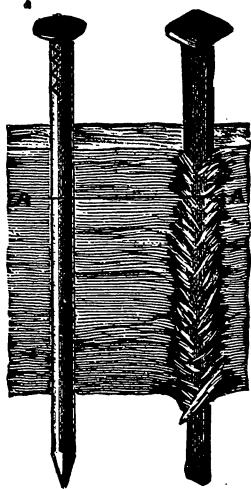
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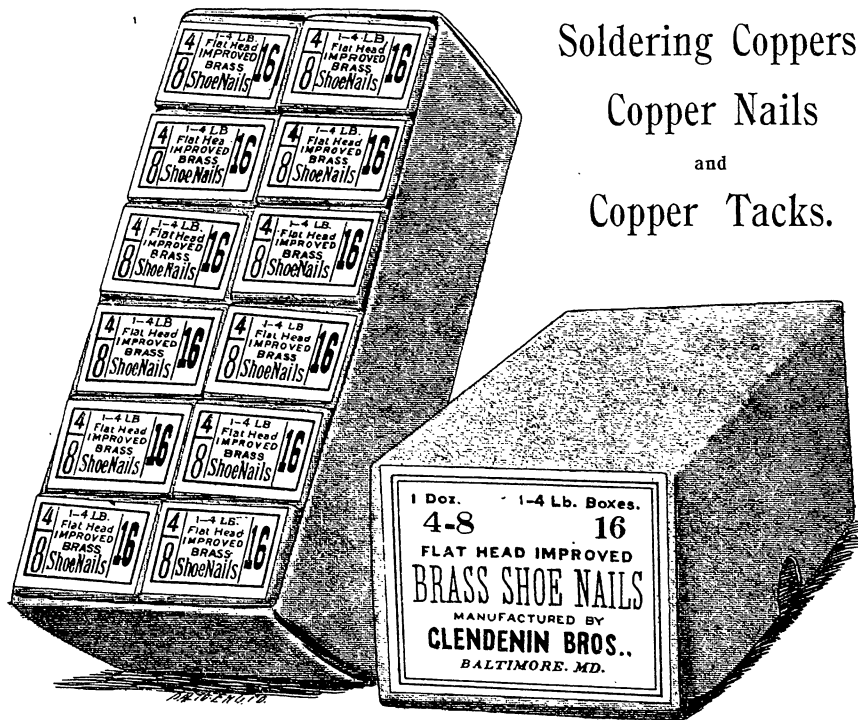
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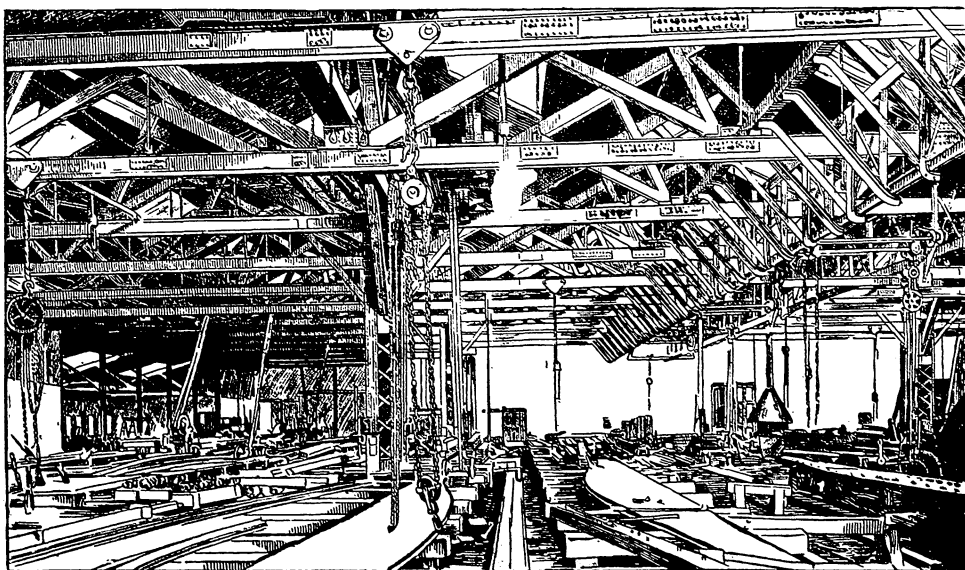
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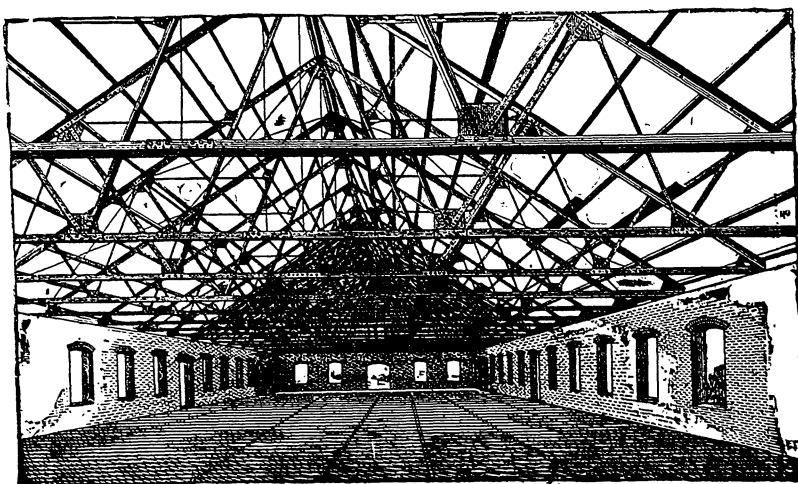
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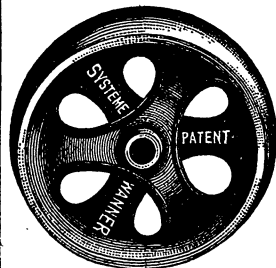
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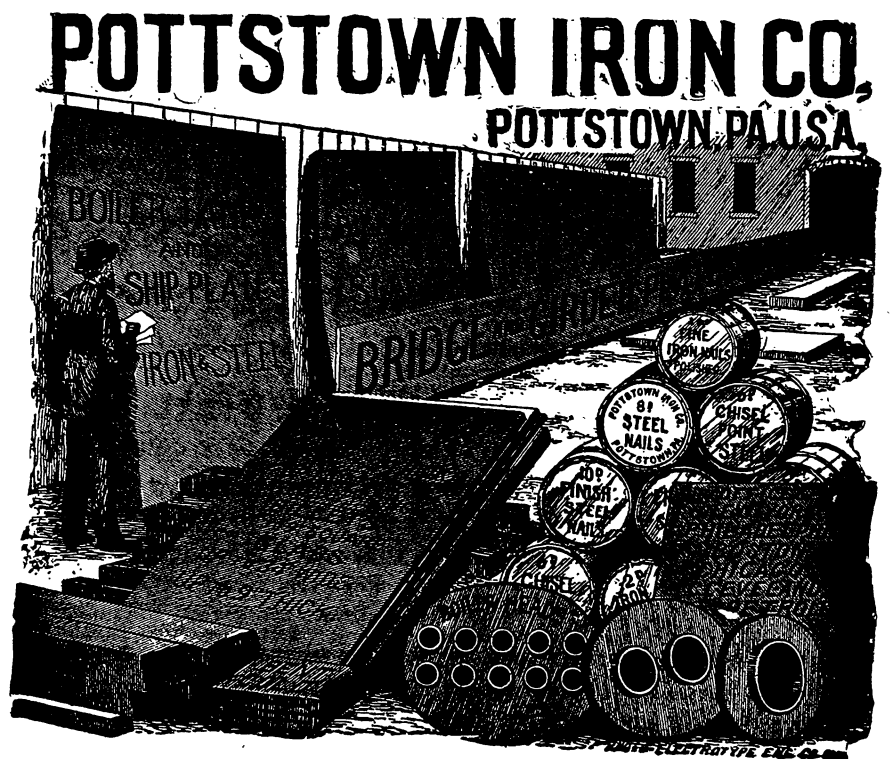
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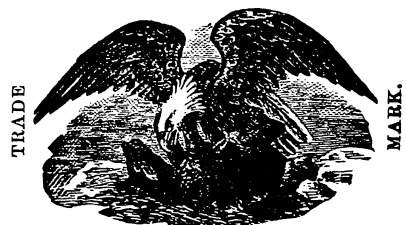
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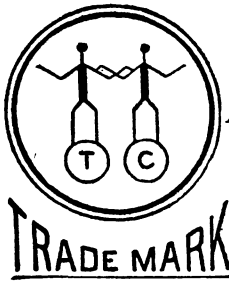
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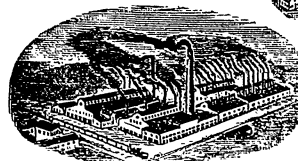
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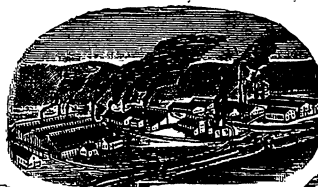
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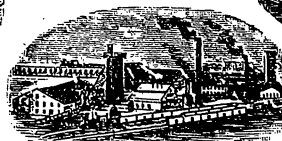
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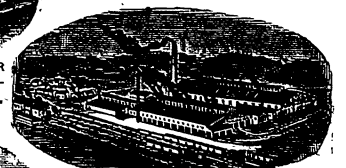
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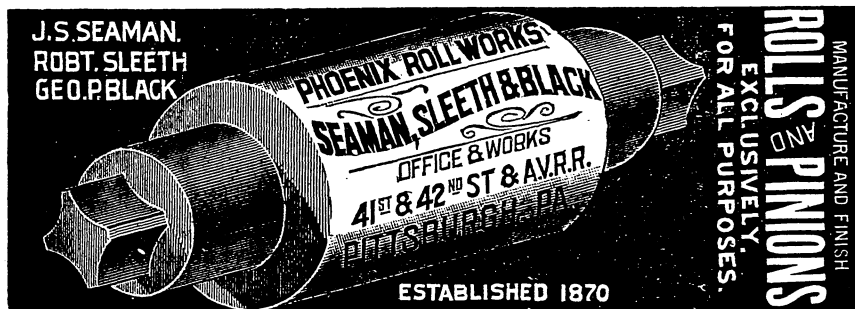
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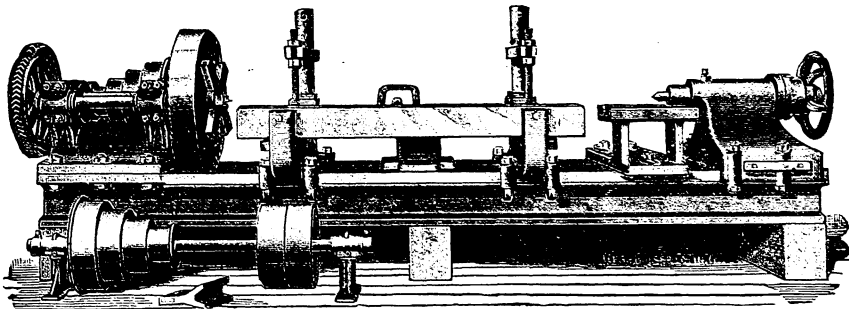
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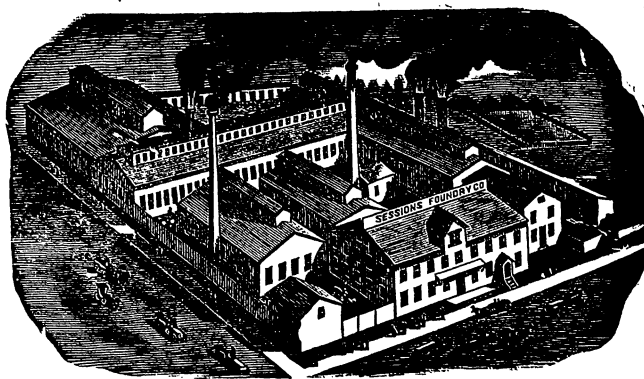
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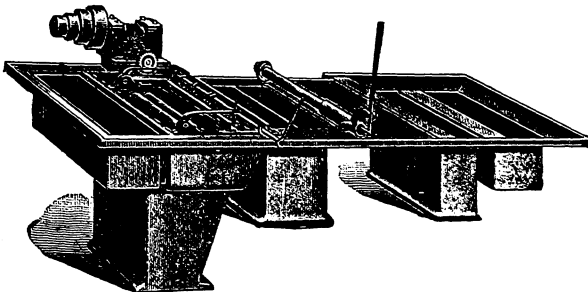
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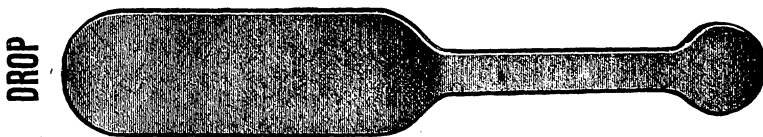
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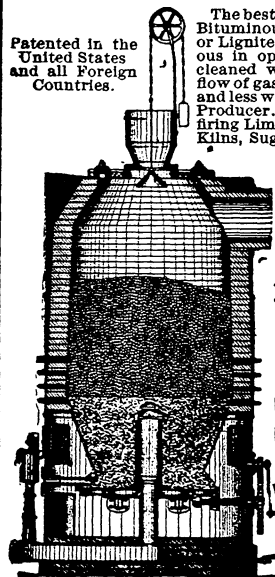
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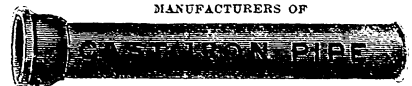
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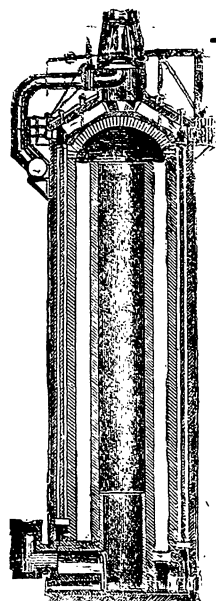
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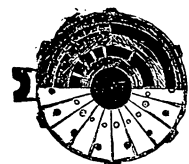
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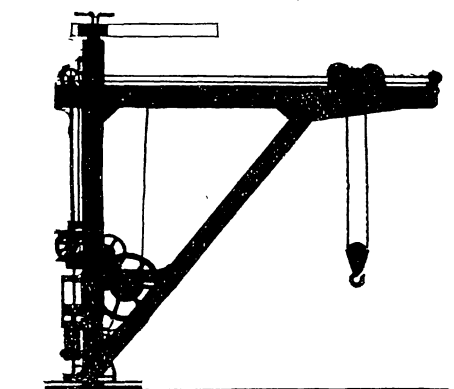
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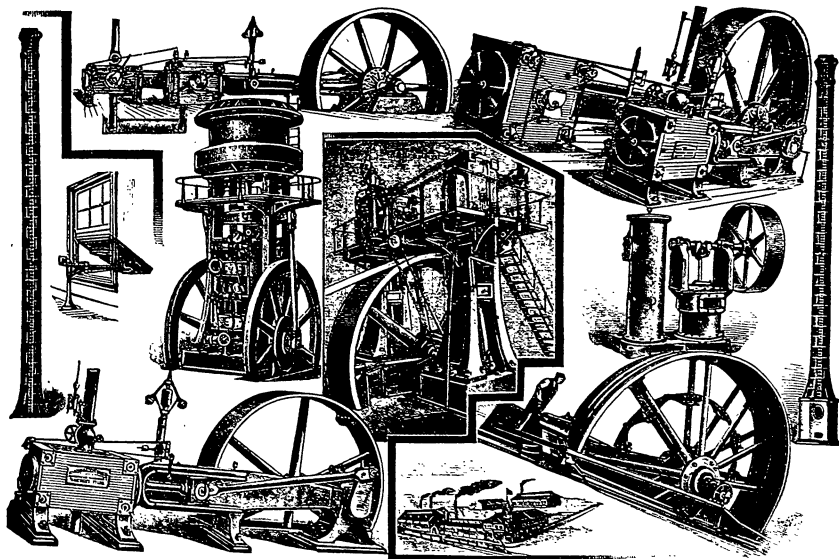
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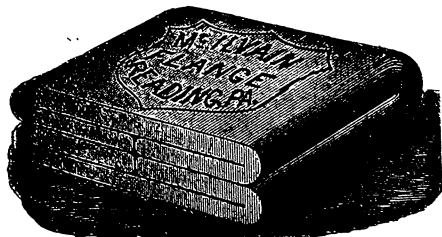
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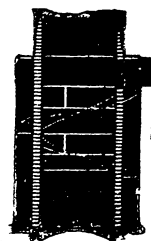
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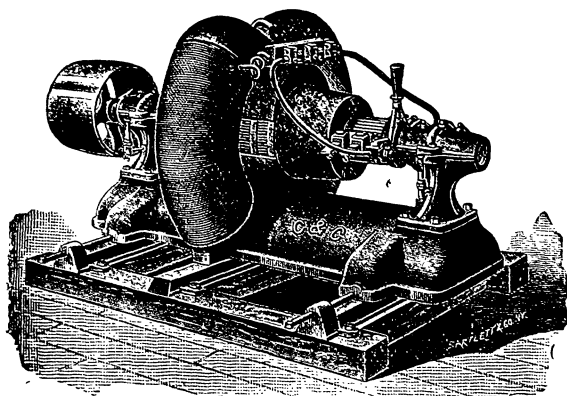
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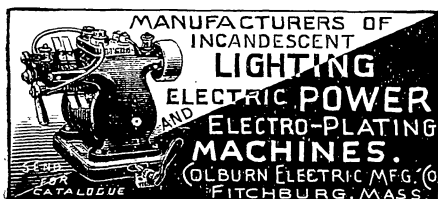
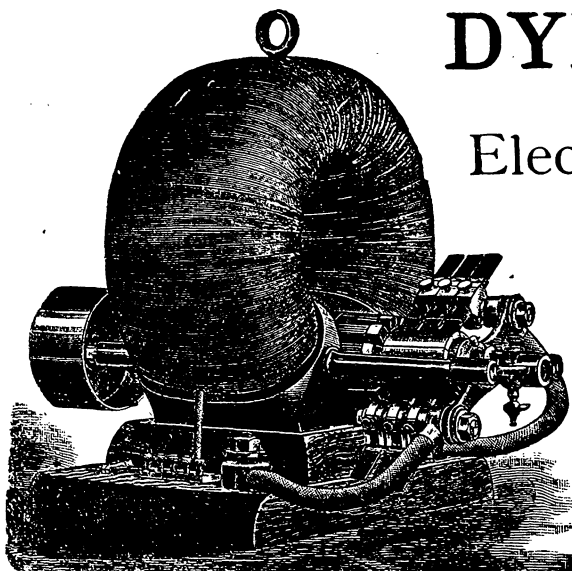
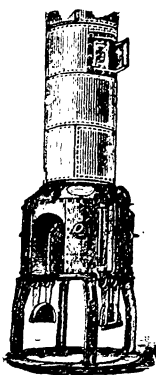
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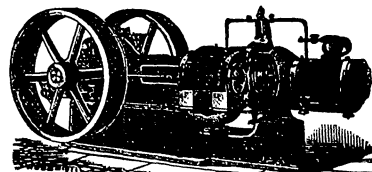
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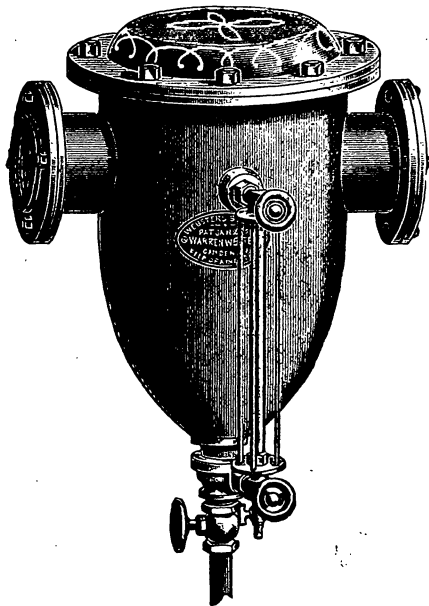
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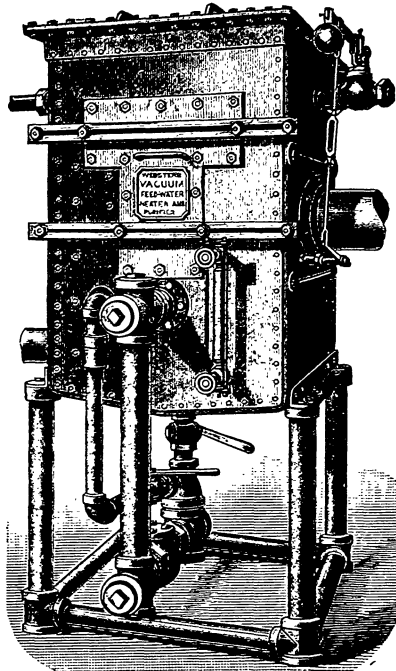
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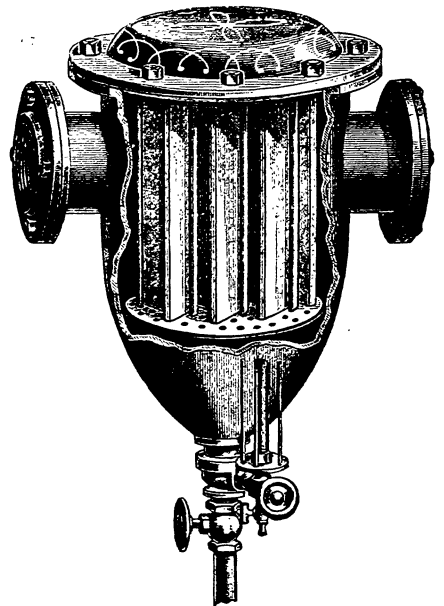
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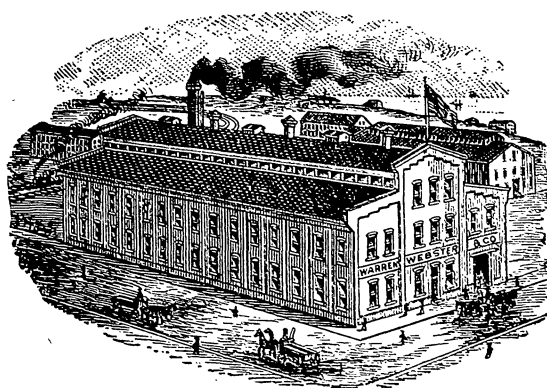
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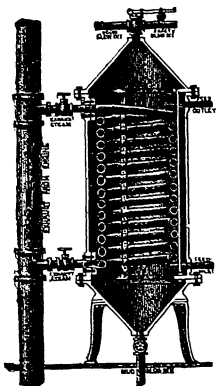
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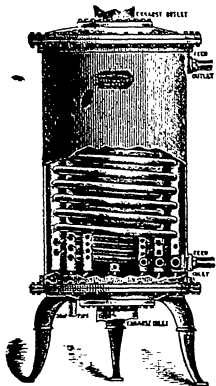
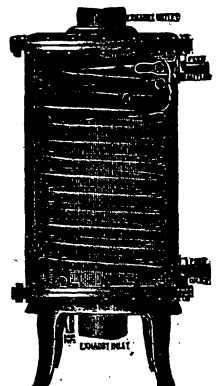
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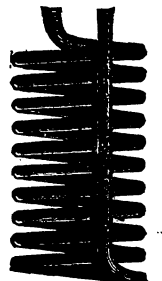
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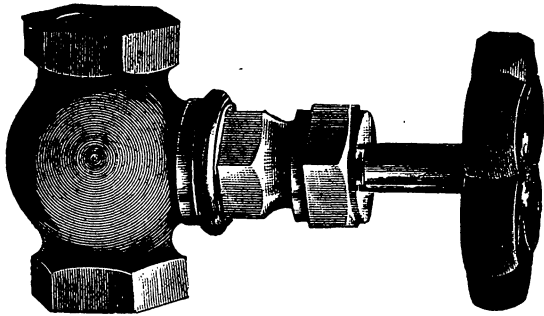
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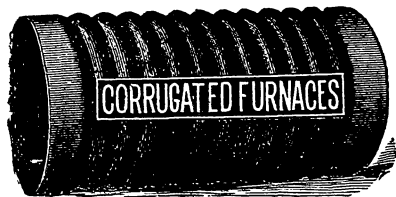
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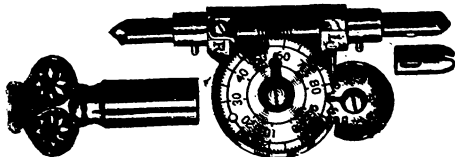
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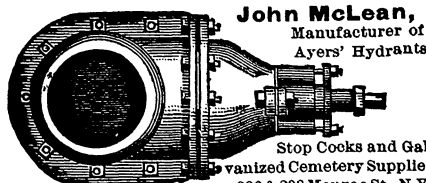
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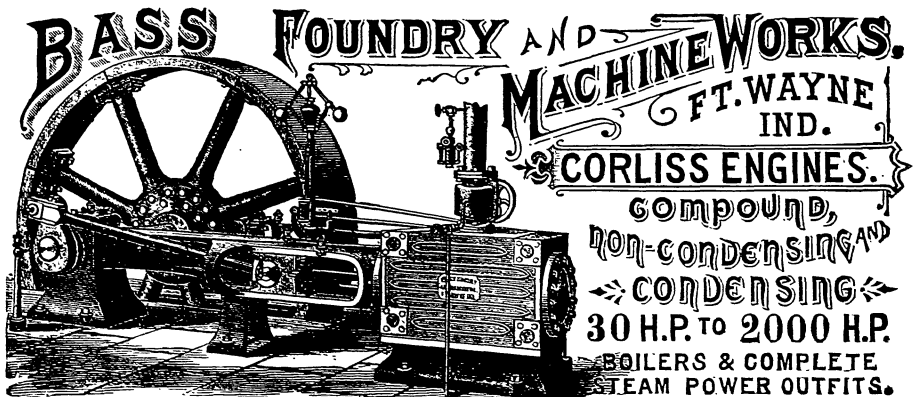


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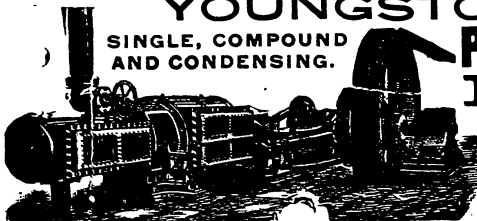


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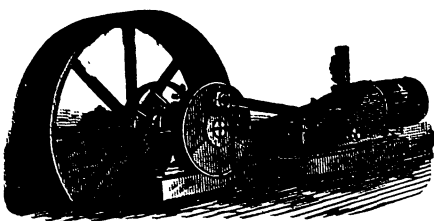


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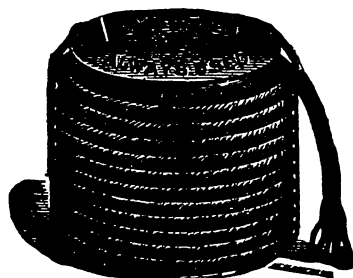


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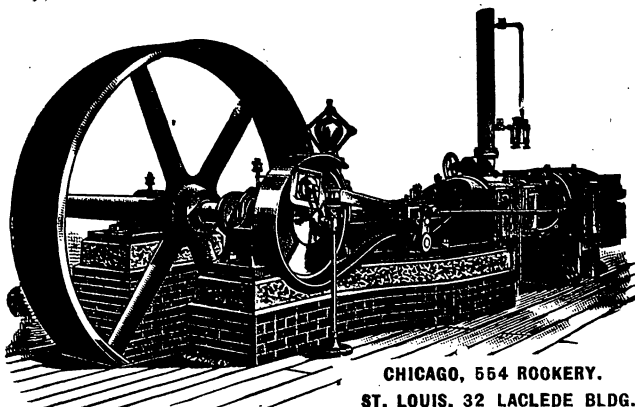
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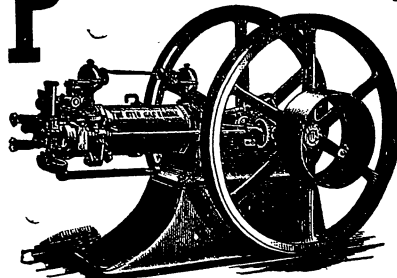
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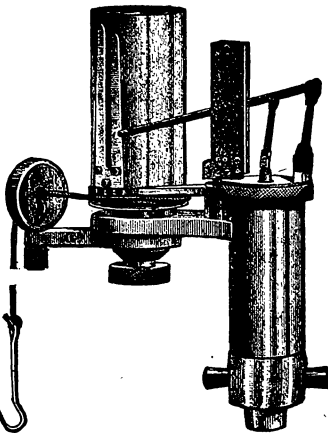
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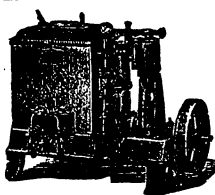
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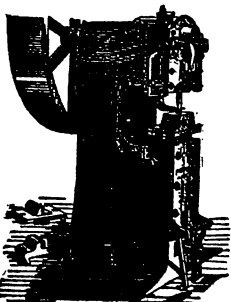


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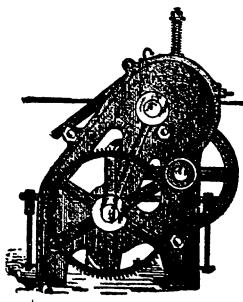
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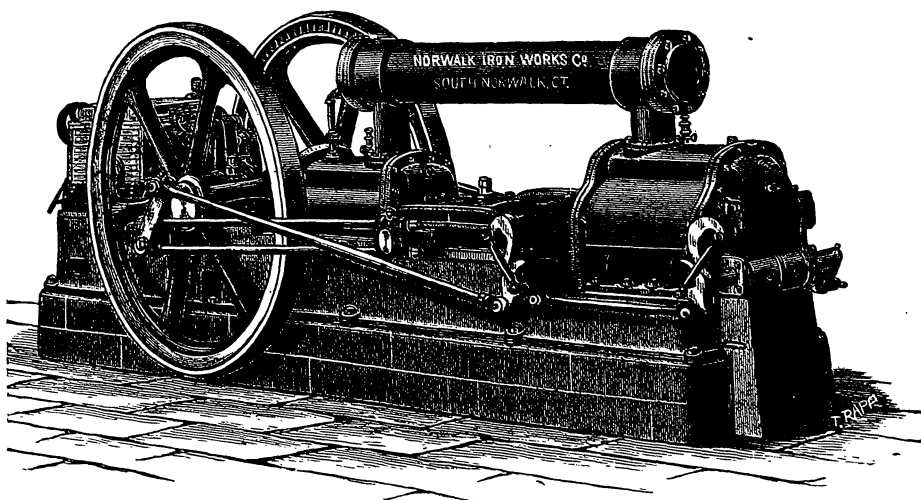
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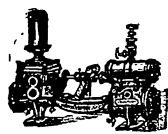
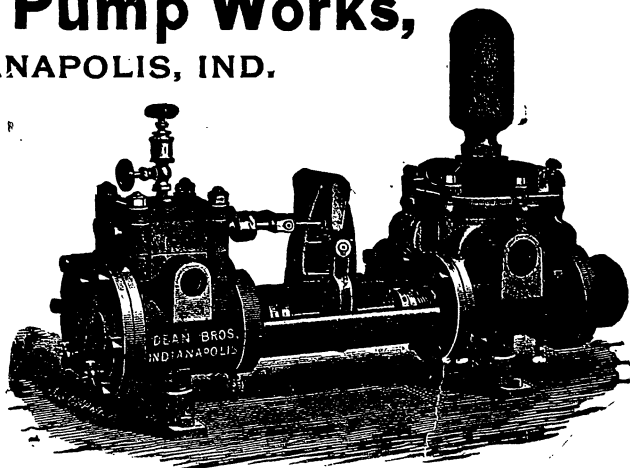
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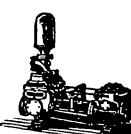
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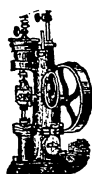
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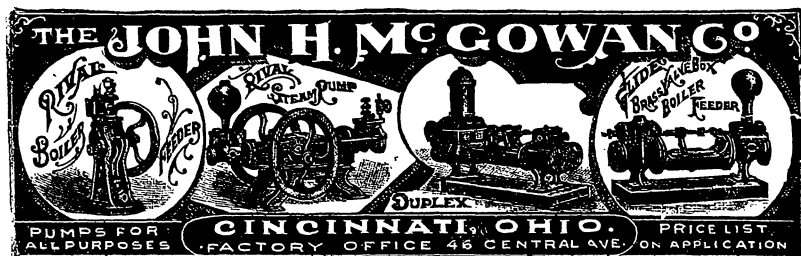
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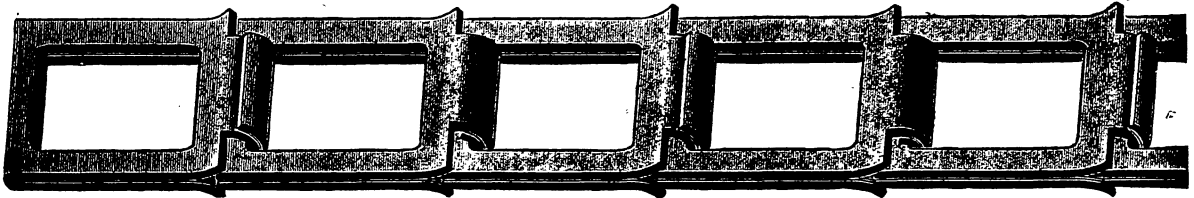
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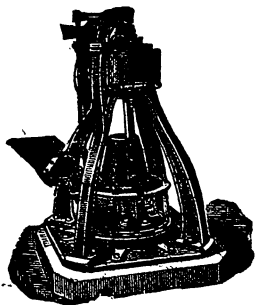
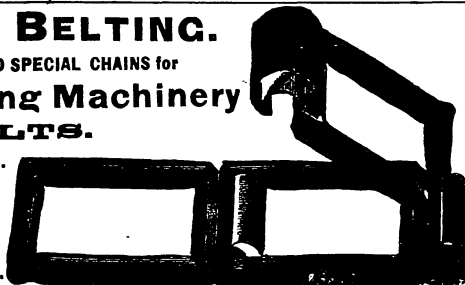
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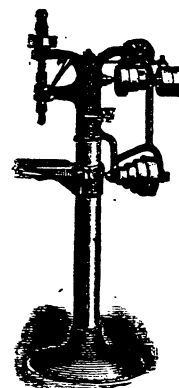


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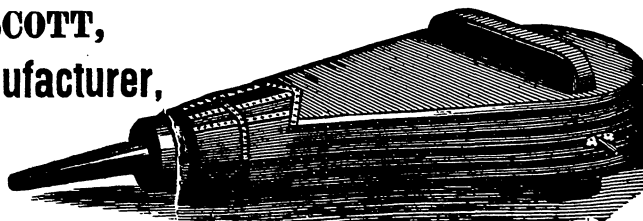


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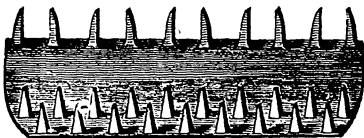
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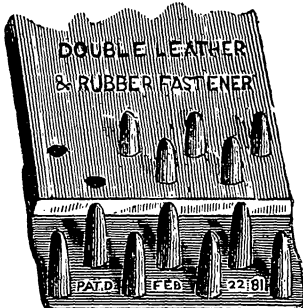
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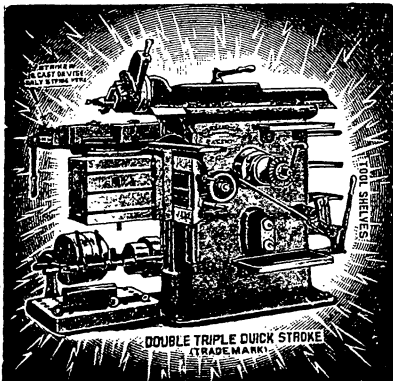
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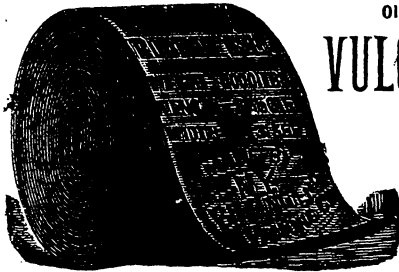
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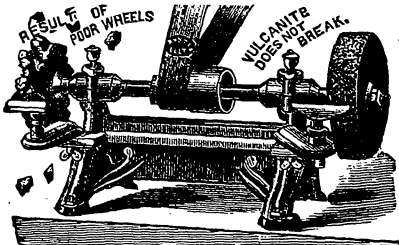
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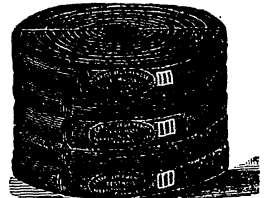
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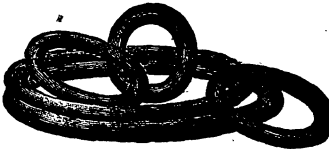
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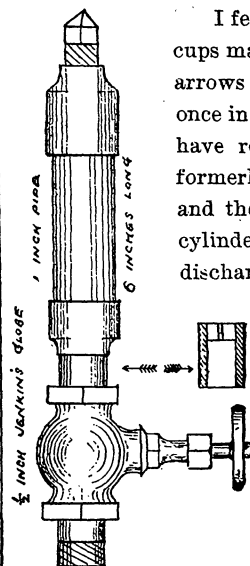


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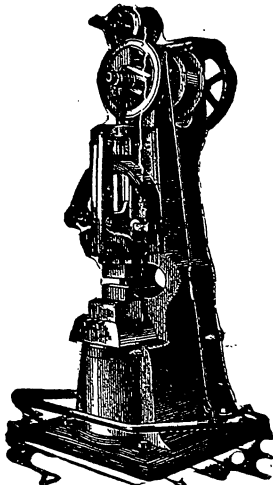
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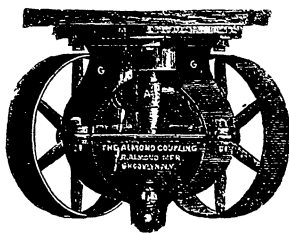
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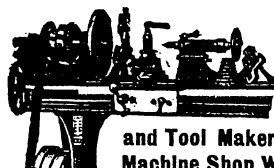
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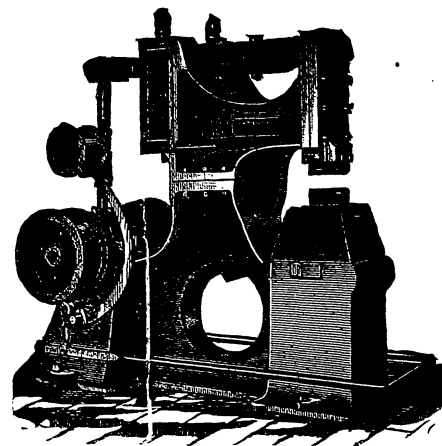
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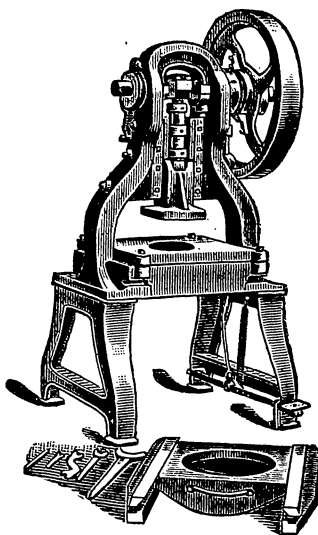
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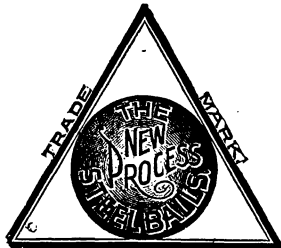
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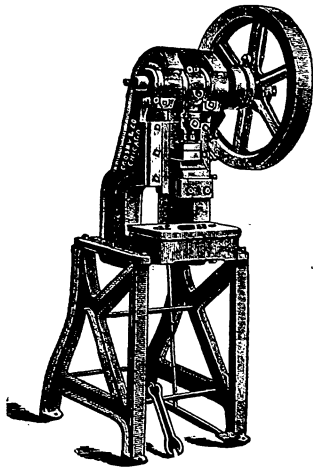
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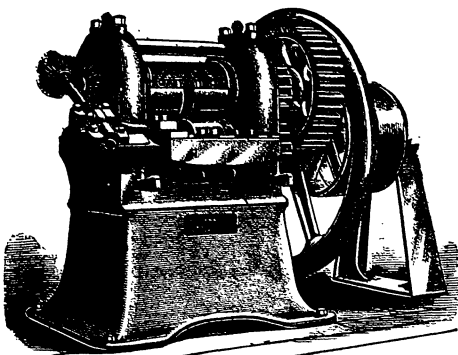
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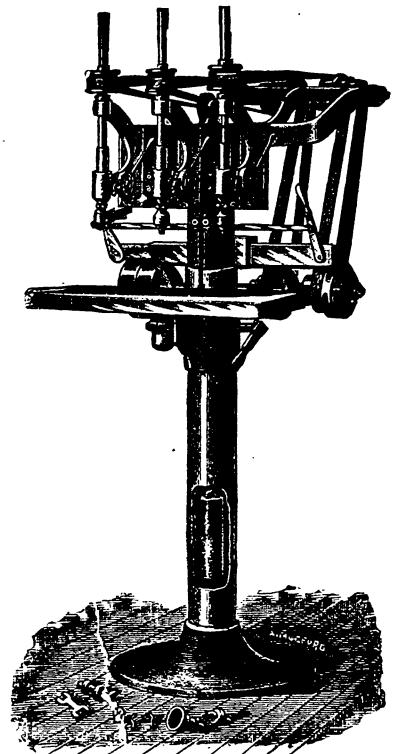


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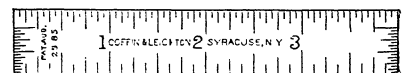
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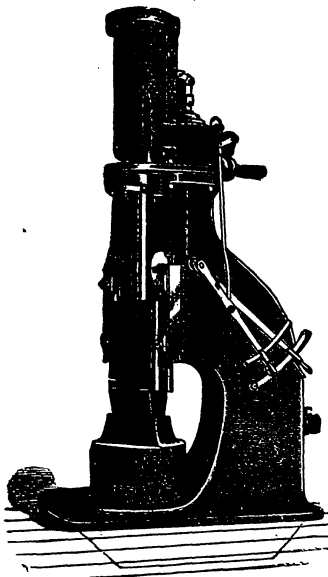
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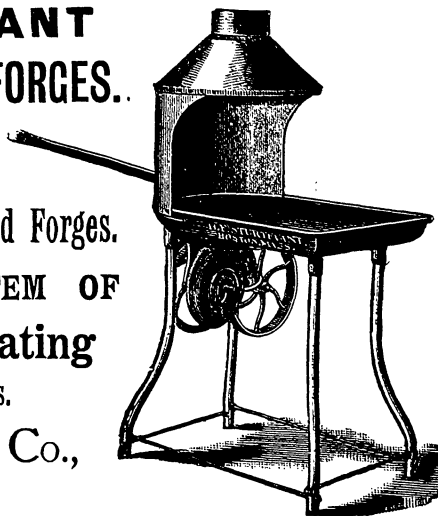
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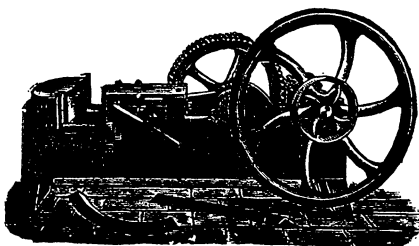
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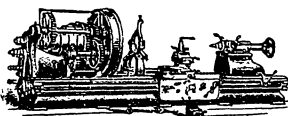


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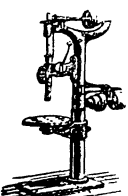


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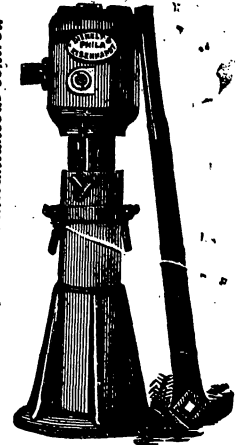
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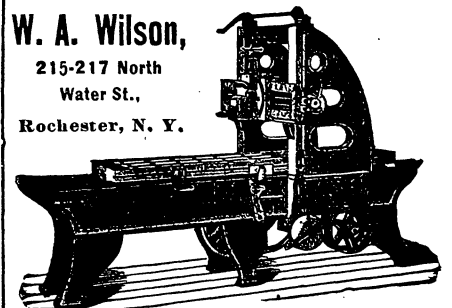
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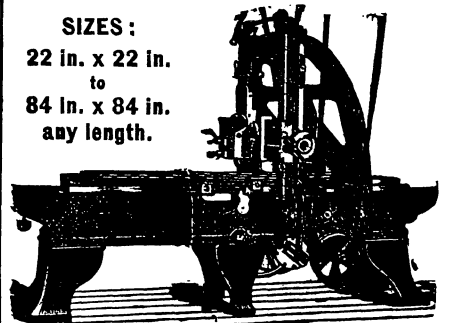


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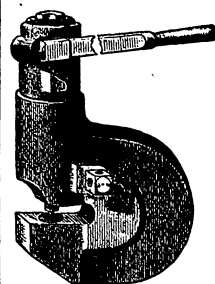
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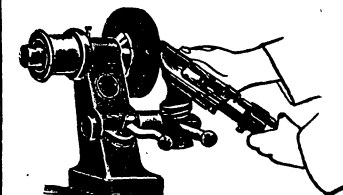
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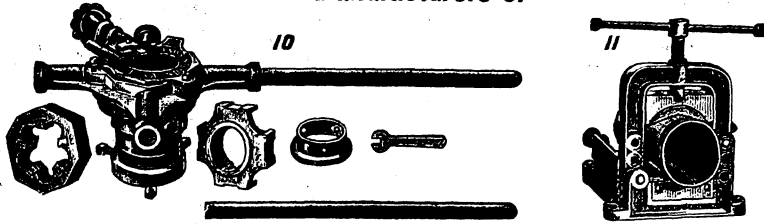


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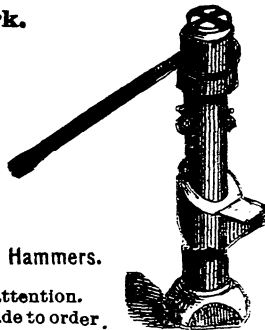
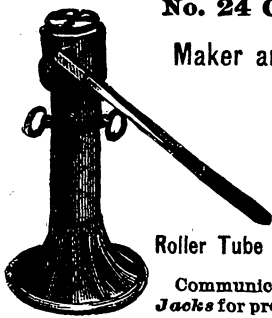
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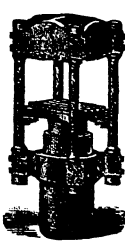
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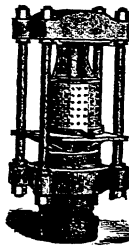
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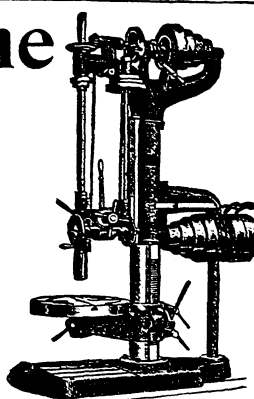
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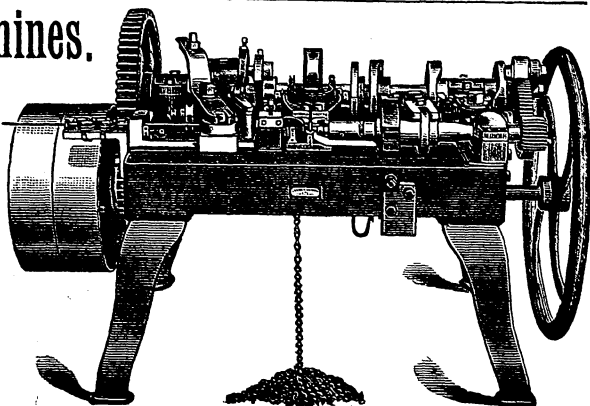
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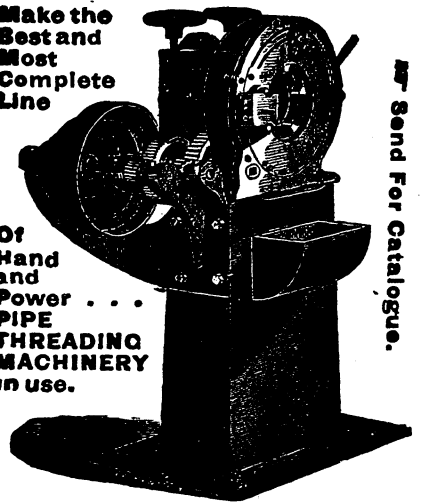
Waterbury, Conn.



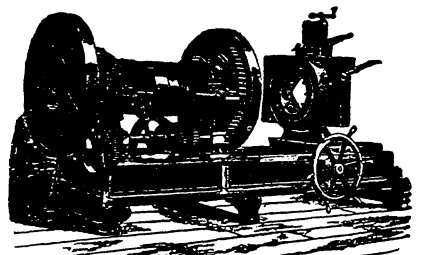
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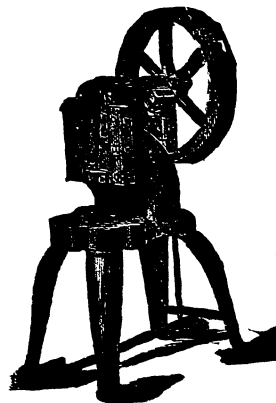


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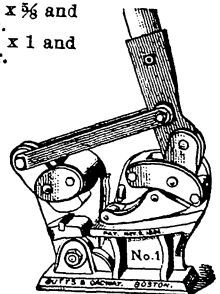
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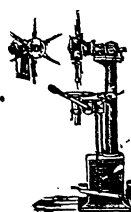
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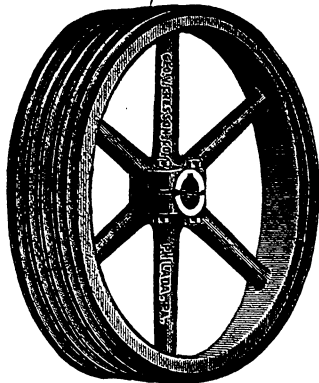
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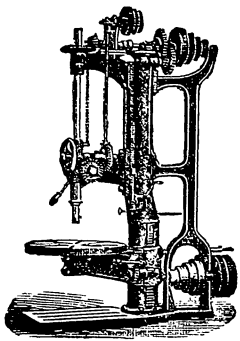
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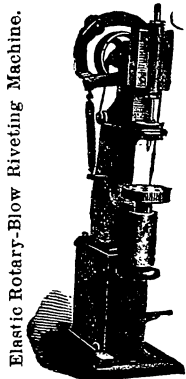
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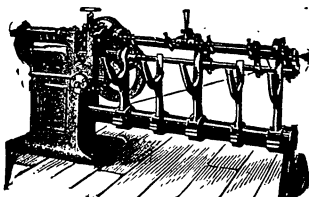
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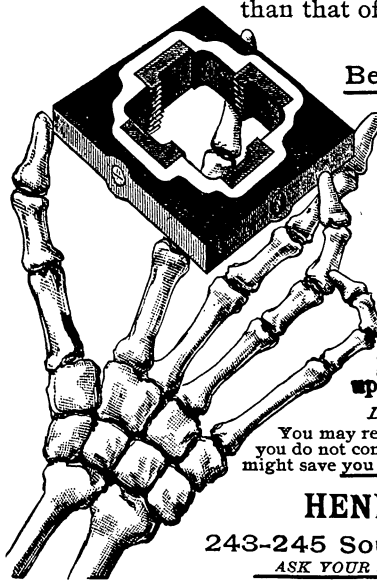
2

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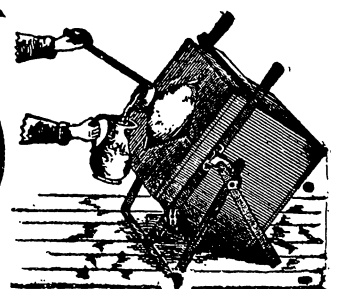
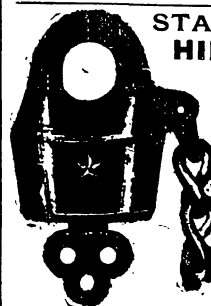
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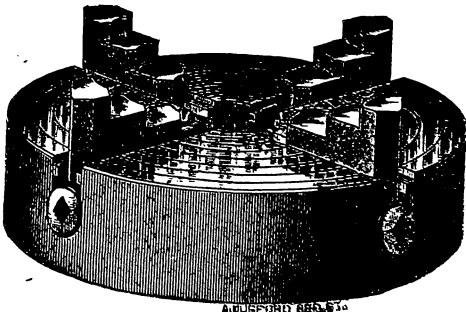
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 Reversible Face-Plate Jaws for Use on Lathes from 30 to 72 Inch.
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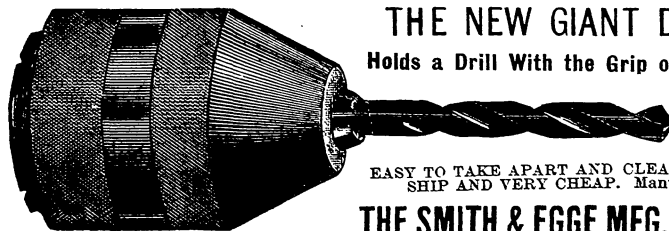
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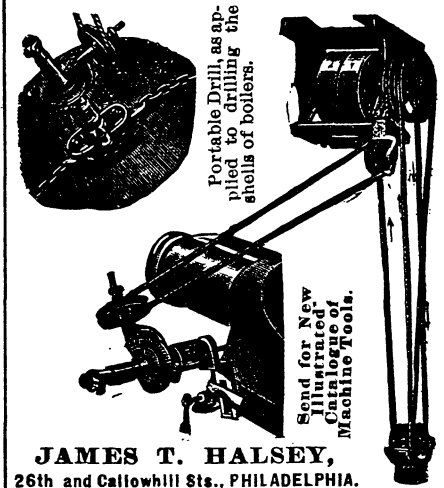
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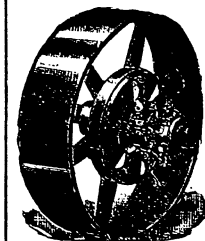
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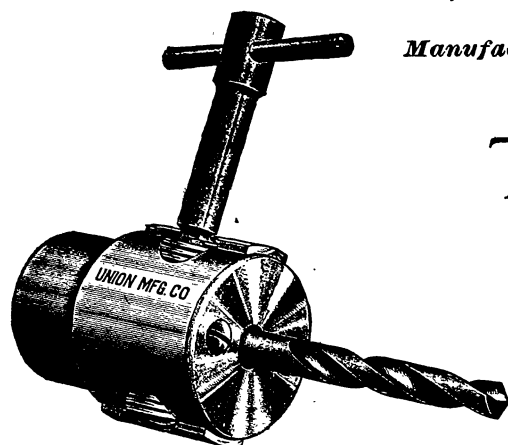
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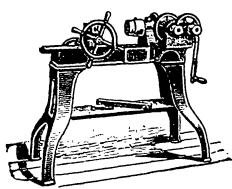


Manufacturers of Combination, Universal, Independent, and Combination Reversible Jaw Chucks.

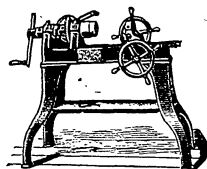
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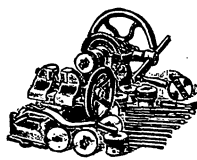
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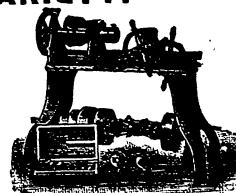
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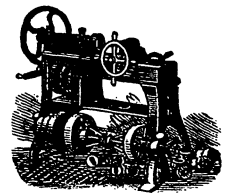
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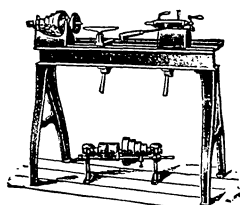


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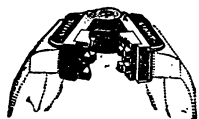
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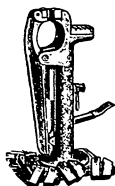
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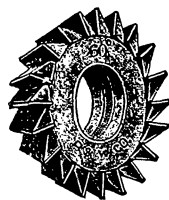
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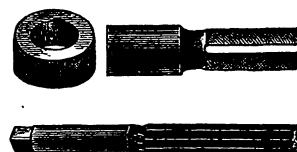
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Pratt & Whitney Co.,

Hartford, Conn., U. S. A.,



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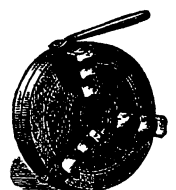
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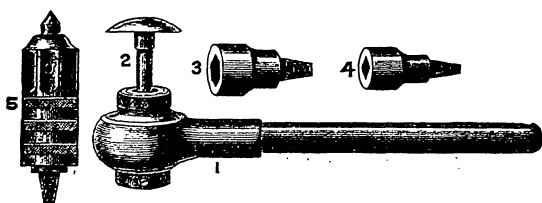
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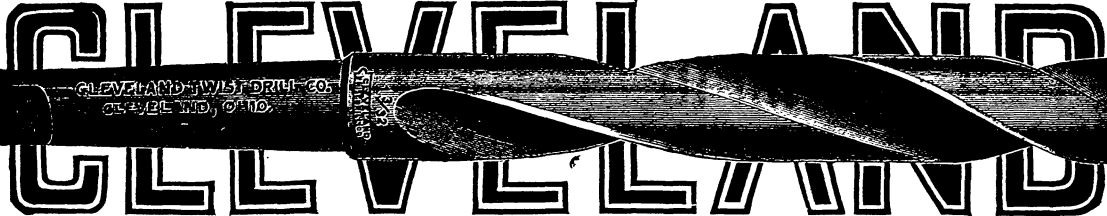
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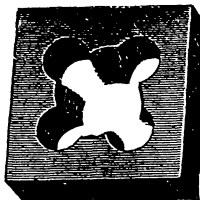
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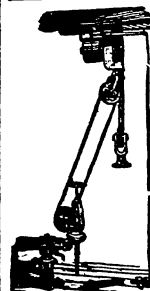
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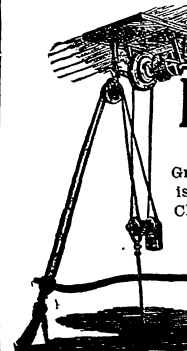
26th, Callowhill & Biddle Sts.
PHILA., PA.,

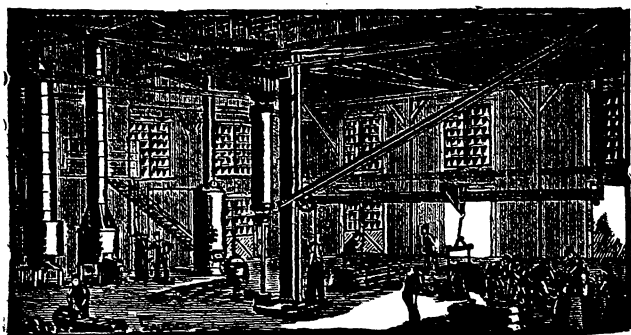
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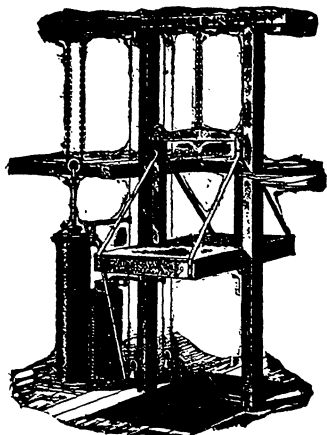
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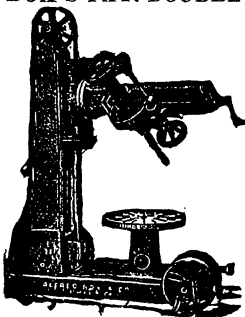
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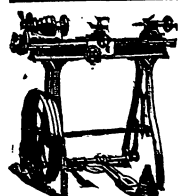
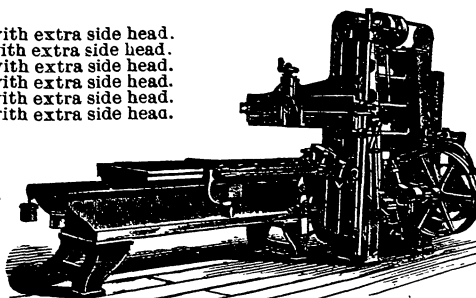
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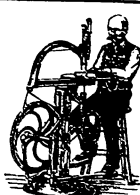
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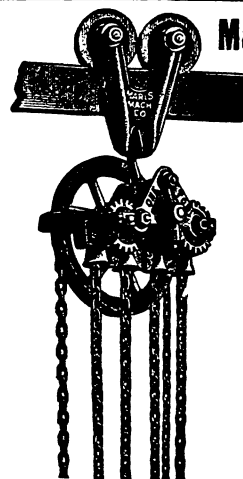


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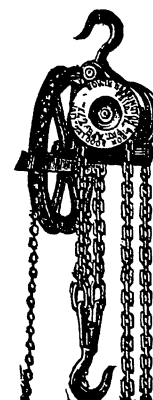
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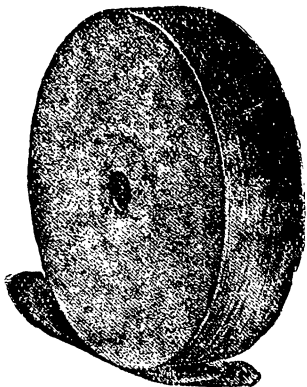
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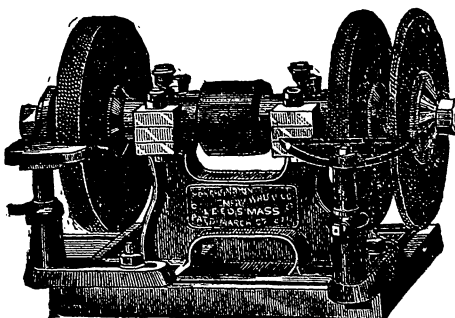
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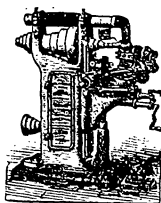
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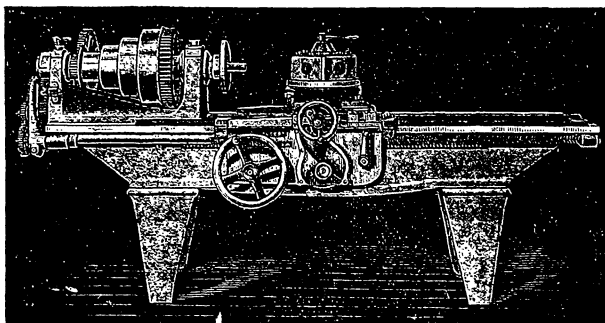
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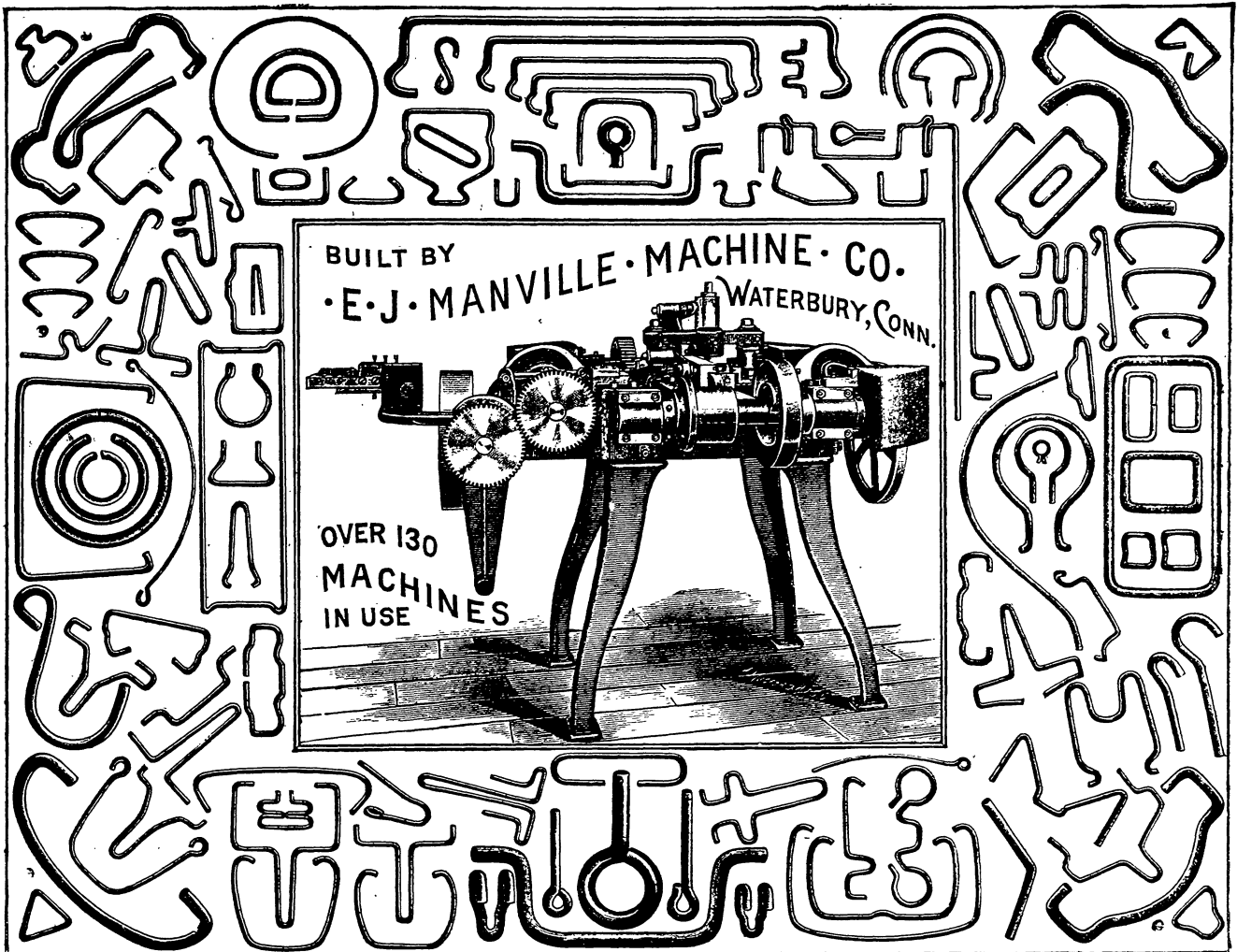


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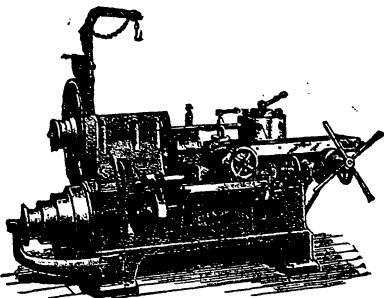
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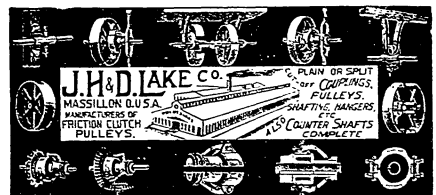
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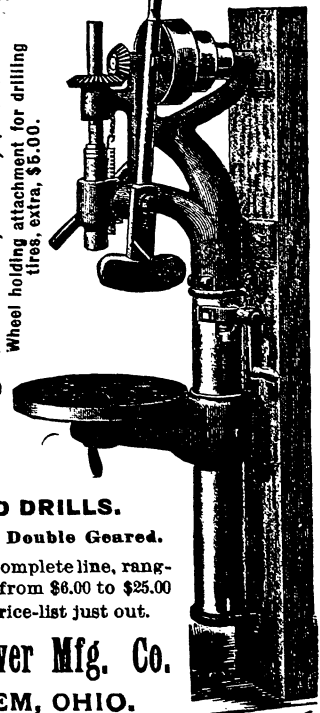


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19½ in. x 48 in. Beam Engine, with Knowles Condenser.

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SECOND-HAND MACHINERY.

One American Tool Co.'s No. 2 Cabinet Turret Lathe, with slide rest; in fine order.
One Pratt & Whitney 36-in. Gap Chucking Lathe.
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One Springfield Universal Grinding Machine No. 3, swing 18½ in. over the ways and take 6 ft. between centers. Has been used but a very few times and is practically new.
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Hand Lathes, from 10 in. to 20 in. swing.
Planers, from 24 in. x 5 ft. to 42 in. x 12 ft.
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Milling Machines, Plain and Universal.
Brown & Sharpe Screw Machines.
1 Large Newton Slotting Machine.
1 Large Pond Mach. Tool Co.'s Radial Drill Press.
8 Gould & Eberhardt Automatic Gear Cutters, 36 in., 48 in. and 60 in.
1 Betts Machine Co. Large Horizontal Boring Mill.
2 Large Bliss Power Presses.
1 10 H.-P. Baxter Engine, with 15 H.-P. Boiler, complete. As good as new.
Also Tool Grinders, Die Sinkers, Tapping Machines, Bolt Cutters and Large Pattern and Blacksmith Shop Equipments.
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Call at our salesroom and inspect them, or write for complete descriptive circular and price-list.

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800 tons 35-lb. Tee Iron Rails, 100 tons 30-lb. Tee Iron Rails, all in good condition for relaying, complete with fish plates and spikes. Also several complete switchboxes. Apply to
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800 tons 35 pound Iron T's.
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Three 36 tons Standard Gauge.
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One 7 tons 39 in. Gauge Saddle Tank.
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9 in. Potter & McDougall Steam Hammer.
500 ton Bushnell Knuckle Joint Press.
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2 16 in. x 6 ft. Blaisdell Lathes.
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1 18 in. x 8 ft. Dustin Lathe.
2 20 in. x 6 ft. Bullard Lathes.
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4 H.-P. and 7 H.-P. gas engines.
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1 Corliss Band Wheel, 12 ft. x 24 in., in halves.
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No. 308 Walnut St., Philadelphia, Pa.

SALE OF VALUABLE PROPERTY
of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court of the State of New York, granted in the City of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The real estate and buildings owned by the said corporation "The Albany Stove Company," situated on Tivoli street, in the City of Albany, N. Y., being the same premises used by the said corporation in carrying on its business of manufacturing stoves and iron castings, and is the same real estate conveyed by Eugene Van Rensselaer and others, as executors, etc., to The Capital Co-operative Foundry Company, by deed dated October 15, 1893, recorded in Albany County Clerk's office, December 15, 1893, in Book No. 228 of Deeds, on page 241, and by Van Rensselaer Land Company to Albany Stove Company by deed dated January 10, 1890, recorded January 14, 1890, in Book No. 412 of Deeds, on page 318, together with the machinery, tools and implements used in carrying on the business above referred to.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed, and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of the Albany Stove Company," and addressed and delivered to the undersigned at No. 82 State street, Albany, New York, on or before the 17th day of November, 1893. The right to reject any and all bids is hereby reserved, and sale can only be completed upon order of the court.

Bids will be opened by the receiver at the office of Francis H. Woods, No. 116 State street, Albany, New York, on Saturday, November 18, 1893, at 10 A.M. Terms, purchase price to be paid within twenty days after notification of acceptance of bid.

Dated October 11, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

SALE OF VALUABLE PROPERTY
of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court, granted in the city of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The patterns, shop rights and flasks owned by the said corporation, and being the patterns, shop rights and flasks for the "Home Yale," parlor and range, "Yale" cook, "White Oak," "Art Yale Range," "Rose" range, "Oneida," and for other castings, formerly manufactured by the said corporation, a more particular description of which will be given on application to the undersigned.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of The Albany Stove Company," and addressed and delivered to the undersigned, at No. 82 State street, Albany, N. Y., on or before the 17th day of November, 1893.

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Dated October 11th, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

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400 tons of 60-pound, 200 tons 52-pound and 400 tons of 30-pound second-hand Steel Rails, suitable for relaying. For prices, etc., address

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Notice is hereby given that the undersigned, Receiver of The Vienna Enamel & Stamping Company, will sell the assets of said corporation at private sale to the highest bidder. Bids will be received on and after November 16th and up to November 20th, 1898. The plant is situated at Porter, Porter County, Indiana; all the main buildings are made of brick and have been recently erected and the machinery is new. It is located on two and one-half blocks of ground; there are three railroads within a few rods of it; and it is about forty miles from Chicago. There is also a large amount of manufactured product and of raw material on hand. In fact, there is everything ready to start up with the business.

Terms of Sale: The plant with tools and fixtures will be offered together for one third cash and the balance in equal payments of twelve and eighteen months; the purchaser to give his notes with mortgage on the premises to secure the same, with interest at six per cent. payable annually, and he must keep the property insured in good companies to an amount sufficient to cover loss by fire, payable to the receiver. The manufactured and the raw material will each be offered separately, and the whole will be sold for all cash or one-half cash and the balance in six months; the purchaser giving his note with approved security for the deferred payments, with interest at six per cent.

All bids on the plant, fixtures and tools must be accompanied by a deposit of two thousand dollars cash, conditioned that the bidder will make good his bid if accepted; and all bids on the personal property must be accompanied by a like deposit of two thousand dollars.

EDWARD ECKEL,
Receiver of the Vienna Enamel and Stamping Company.

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To close estate of John R. Smith, late of Springfield, Mass., the executors offer for sale the old established business of the Springfield Iron works, including real estate, stock and machinery.

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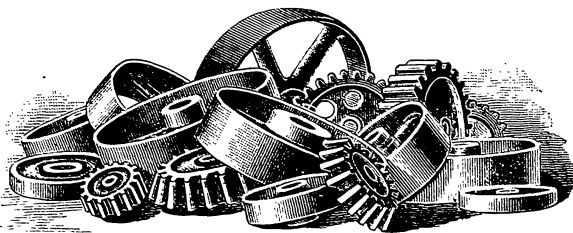
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AN EXPERT Accountant and man of executive ability, at present holding responsible position with a large manufacturing company, desires making a change; can furnish bond and references from present employers. Address "MANUFACTURER," Box 1026, office of *The Iron Age*, 96-102 Reade St., New York.

BY A YOUNG MAN of ability, to look after the exhibit of a house dealing in iron working machinery, engines, etc., at the Midwinter International Exposition at San Francisco. Address "EXHIBIT," office of *The Iron Age*, 96-102 Reade St., New York.

AS FOREMAN of iron foundry; 14 years' experience as foreman; light or heavy castings in green or dry sand; best of references. Address "LIGHT OR HEAVY," office of *The Iron Age*, 96-102 Reade St., New York.

BY A FOUNDRY FOREMAN of long experience, where ability and faithful services will be appreciated; good record; distance no object. Address "F. F.," Box 1026, office of *The Iron Age*, 96-102 Reade St., New York.

AS FOREMAN of iron foundry, by a competent and reliable man; best of references. Address "Geo. B. F.," office of *The Iron Age*, 96-102 Reade St., New York.

AS MECHANICAL ENGINEER or Superintendent; has made a specialty of design and construction of heavy hydraulic machinery; has designed and superintended the erection of some of the largest hydraulic forging plants in this country; also familiar with modern bridge plants and their machinery; the very best of references. "ENGINEER OR SUPT.," office of *The Iron Age*, 96-102 Reade St., N. Y.

GENTLEMAN seeks chief-clerkship or similar position with mercantile house; six years' experience with two first-class houses in iron and steel trade; also experienced telegraph operator and stenographer; best references. "C. C.," Box 1026, office of *The Iron Age*, 96-102 Reade St., New York.

SITUATION wanted by a traveling salesman having extensive acquaintance with jobbers of hardware and with carriage manufacturers in 23 States. Thoroughly familiar with all kinds of carriage material, and some line of such goods preferred, but would handle another line. Reference past employers. Address "CARRIAGE HARDWARE," office of *The Iron Age*, 96-102 Reade St., New York.

IRON WORK FOREMAN OF CONSTRUCTION.—A thoroughly practical man of experience and push, temperate and reliable, at present in charge of a large job, will be open for position about November 1st; is accustomed to plans, and can handle men to advantage; has good recommendations. Address "ANGLE," office of *The Iron Age*, 96-102 Reade St., N. Y.

AS TRAVELING SALESMAN in the iron, steel or accessory trades, by a man of 17 years' experience; has traveled largely in most States east of Rocky Mountains, but particularly in New England and Middle States; can furnish best references. Address "W. H. S.," 818 North 25th St., Philadelphia, Pa.

BY A DRAFTSMAN, experienced in boiler, engine and general machine work; all references furnished. Address "A1 DRAFTSMAN," office of *The Iron Age*, 96-102 Reade St., N. Y.

BY SUCCESSFUL Stamping Works Superintendent, thorough machinist, die maker; large experience laying out plans, starting and running new works, designing, building, labor saving tools and machinery; all manager of men, factory or machine shop; controls stamped article, pays good profit to manufacturer; best reference. Address "STAMPING," office of *The Iron Age*, 96-102 Reade St., New York.

AMERICAN, 33, intending shortly to go to France, would like to hear of some firm, preferably manufacturing, desiring a permanent representative there; advertiser speaks French fluently and is well connected in France; easy terms will be made with a first-class house; no others need answer. Address "Z. X. Y.," office of *The Iron Age*, 96-102 Reade St., N. Y.

A YOUNG MAN, 25, will change position; eight years with well known and one of largest concerns manufacturing builders' hardware (four as bookkeeper and assistant manager); quick, accurate accountant; experienced in able and economical management, all operating prices and complete data; thoroughly familiar with labor, costs, supplies, etc.; hard worker; can superintend; highest references; satisfactory reasons. "BUSINESS," No. 1019, office of *The Iron Age*, 96-102 Reade St., N. Y.

WOULD LIKE A POSITION with some Western party starting a copper or brass rolling and seamless tube factory, giving improved plans in factory and arranging machinery, with improved methods in casting and working metal. Address "COPPER OR BRASS," office of *The Iron Age*, 96-102 Reade St., N. Y.

SUPERINTENDENT or Chief Engineer, by a mechanical engineer of 15 years' experience in general engineering, hydraulics, cranes, sheet, plate and structural iron work, etc.; any one who wants an energetic man to look after their interests will answer this ad. "HUSTLER," No. 1019, office of *The Iron Age*, 96-102 Reade St.

BY A MIDDLE AGED married man, has had many years' experience as bookkeeper, special accountant, keeping cost sheets, etc., of the various articles manufactured in machine shop, boiler shop, foundry and wire mill work; thoroughly understands business, clerically, in all details. Address "CLERICAL," office of *The Iron Age*, 59 Dearborn St., Chicago.

BY A MAN who has had 14 years' experience as manager in a large retail hardware and implement house in the Southwest, as salesman or manager in a similar house; would accept a position as traveler, should the trade in territory allotted justify. Address "H. and J.," Box 1012, office of *The Iron Age*, 96-102 Reade St., N. Y.

BY A PRACTICAL Rolling Mill Man of experience and ability, as manager; is thoroughly competent and reliable; engaged now with a large concern who are going out of business. Address "MANAGER," No. 1012, office of *The Iron Age*, 96-102 Reade St., New York.

HARDWARE AGENCY.—Gentleman having 20 years' experience and established trade, with large hardware jobbing house and retailers, desires to represent manufacturers of staple lines of hardware and kindred goods with headquarters in Chicago. Address "AGENCY," office of *The Iron Age*, 59 Dearborn St., Chicago.

BY A THOROUGHLY Practical Sheet Mill Manager of many years' experience; good references. Address "CASTLE," office of *The Iron Age*, 96-102 Reade St., New York.

AS MANAGER or foreman of a wire mill; have a thorough and practical knowledge of the wire trade in all its branches; twenty-five years' experience, twelve years as foreman; have charge of a large mill at present; am a good all-round mechanic, understanding the working of wire mill machinery and the building of annealing furnaces, bluing ovens, etc.; am strictly temperate and can furnish the best of recommendations from past and present employers; firms desiring a man that knows how to practice economy and run a mill on business principles will find it to their advantage to correspond with me. Address "TEMPERED STEEL WIRE," office of *The Iron Age*, 220 So. 4th St., Philadelphia.

RESPONSIBLE POSITION by a graduated chemist and engineer in steel works or furnace plants; reference President Midland Blast Furnace Co. Address C. W. Kolbe, Midland, Mo.

BY A MEMBER of the A. S. M. E., expert in shop management and economical production of machinery, as superintendent or manager; well posted on dynamical, hydraulic and mechanical engineering and inspection of materials. Address "W. O. W.," office of *The Iron Age*, 96-102 Reade St., New York.

BY A MAN, who has had years of experience as superintendent and manager of both iron and steel mills, a position as superintendent or assistant; will work for a moderate salary; best of references; am a good draftsman and can furnish drawings and working plans for new mill; have built several from ground up. Address "NEW MILL," office of *The Iron Age*, 96-102 Reade St., New York.

HELP WANTED.

Undisplayed Advertisements for Help Wanted not exceeding fifty words One Dollar each insertion. Additional words two cents each.

EXPERIENCED OFFICE MAN.—A large manufacturer of machinery near New York City wishes to arrange with a competent man to take charge of his office; applicant must have had extended practical experience and be fully conversant with all details pertaining to production and cost sheets and the general accounts of a large business, as well as fairly up in mechanical correspondence; all applications must state fully as to experience, age, nationality, salary expected and references, and will be held as confidential if desired. Address "OFFICE MAN," office of *The Iron Age*, 96-102 Reade St., New York.

AN EXPERIENCED MAN as Superintendent of manufacturing company, having an established trade on a ready selling article; must have first-class recommendations and be prepared to take stock in company. Address "READY SELLING," office of *The Iron Age*, 96-102 Reade St., New York.

EXPERIENCED MAN to solicit orders for castings for gray iron foundry doing job work exclusively; a good position for the right man. Address "JOBING," office of *The Iron Age*, 96-102 Reade St., New York.

A MECHANICAL ENGINEER of practical shop experience may avail himself of a splendid business opportunity with a concern within 200 miles of Chicago; must purchase an interest in the business if capable of filling the position of superintendent; satisfactory terms will be given on a portion of the corporation's stock. Address "ENGINEER," Box 26, office of *The Iron Age*, 59 Dearborn St., Chicago.

A SALESMAN, familiar with the hardware and implement trade, to represent a large manufacturing company in Mexico and South American countries; must speak Spanish. Address, with references, stating salary expected, "SALESMAN," No. 1026, office of *The Iron Age*, 96-102 Reade St., New York.

SALESMAN traveling the jobbing and large retail trade in the East, one in the West, and one in the South, to handle line of hardware specialties as side line; salary or commission; the line is too small for manufacturer to travel alone. Address "L.," office of *The Iron Age*, 220 S. Fourth St., Philadelphia.

FOREMAN to take charge of blacksmith shop doing car work and general forging; must be a thoroughly practical blacksmith, capable of handling men to the best advantage; state age, experience, and give references. Address "CAR WORK," office of *The Iron Age*, 96-102 Reade St., New York.

A GOOD SALESMAN calling on mill owners and users of boilers, to introduce a first-class boiler compound on commission. Address THE VEGETABLE BOILER COMPOUND CO., Utica, N. Y.

COMPETENT FOREMAN, in wrought iron and wire factory; must be experienced in all its branches; give references and salary expected. Address "WIRE AND IRON WORKER," office of *The Iron Age*, Bank of Commerce Building, St. Louis.

AN EXPERIENCED Business Manager for an old established iron and steel works, located in one of the Middle States. Address, giving full particulars, "T. J. W.," office of *The Iron Age*, 96-102 Reade St., New York.

SALESMAN drumming the hardware trade to handle as a side line, on commission, Mason's patent door lock and ventilator combined; new and salable. BROOKLYN SPECIALTY CO., 186 Pierrepont St., Brooklyn, N. Y.

THE ROBERT W. HUNT & CO.

Bureau of Inspection, Tests and Consultation.

Rails, Splices and Cars. Analytical and Physical Laboratories. Examination of Iron and Steel Work and advice on Processes.

General Office: The Rookery, Chicago. Branch Offices: Hamilton Building, Pittsburgh; 28 Chestnut St., Philadelphia; 80 Broadway New York.

BEFORE

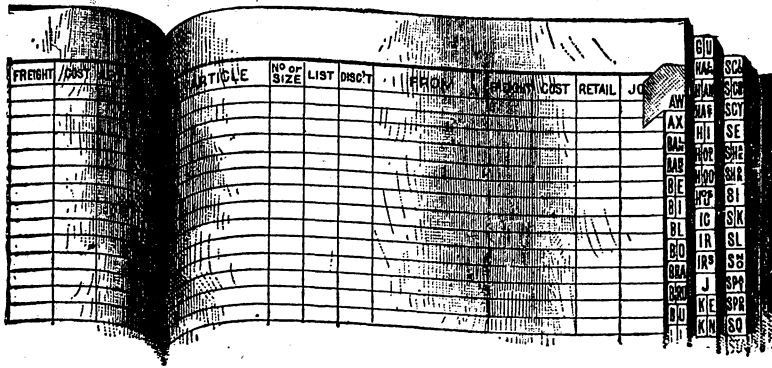
Placing your order for next season's supply of
**GRASS HOOKS, Marks Patent,
CORN KNIVES,
HAY KNIVES, Etc.**

Drop us a line. You will hear from us promptly in an agreeable way. Goods are conceded to be the finest in finish and quality ever offered the trade.

Bruce & Marks Manufacturing Co., GAS CITY, INDIANA.

The Iron Age Hardware Price Book E.

SECOND EDITION, REVISED AND ENLARGED, WITH MULTIPLE INDEX (Patent Pending).



AD GU SC₀
 AN HA_M SCR
 AU HAN SCY
 AW HA_S SE
 AX HI SH_E
 BA_N HO_L SH_R
 BA_S HOO SI
 BE HO_S SK

Fac-Simile of Indexing.

SIZE.—The book is 7 x 10 inches (much larger than Price Books A, B, C, or D), 350 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line.

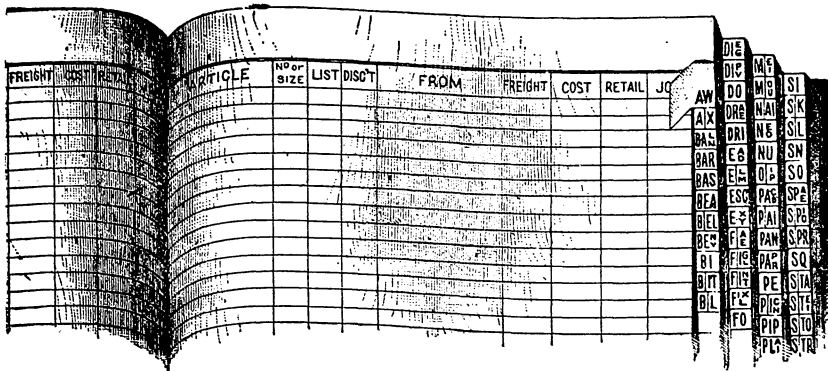
ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

SUPPLEMENT.—A 40-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$5.00.

The Iron Age Hardware Price Book F.

WITH MULTIPLE INDEX (Patent Pending).



AD DI_E MF SI
 AN DI_V MO SK
 AU DO NAI SL
 AW DR_E N_O SN
 AX DRI NU SO
 BA_N E_D O_P SP_E
 BAR E_M PA_D SP_O
 BAS ESC PAI SPR

Fac-Simile of Indexing.

SIZE.—The book is 8 1/4 x 11 inches (much larger than Price Books A, B, C, D or E), 556 pages.

PAPER.—The paper is the celebrated Crane's heavy ledger paper, tough and strong, permitting frequent changes and erasures.

BINDING.—The binding is of the very best quality—flexible seal grained leather.

INDEX.—By means of the arrangement shown in the cut the four rows of index applies to every page (except Supplement) and permits reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. It has been prepared with great care, and it is believed that it provides a place for every article in the Hardware line, and gives ample space for recording prices.

Sufficient space has been provided for large lines of goods such as Axes, Bits, Sprinks, etc., by allowing four pages to such indices, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in AX for example, in Book F by having a short tab with the letter A on the tab on the first leaf, and AX on the tab on the second leaf. The A on the first leaf is directly over the A on the lower leaf, so that the index reads AX whether looking at both leaves together, or at the lower one only.

The four rows of index tabs are printed in gold letters on black Russia leather. The tabs are securely fastened on both sides of each page, making a handsome and durable index.

ARRANGEMENT.—The book is arranged to keep a complete record of prices on a single page, the width giving sufficient room.

SUPPLEMENT.—An 80-page Supplement is provided to give room for supplemental quotations, memoranda, tables, &c.

THIS BOOK IS ISSUED IN ONLY ONE EDITION, PRICE, \$7.50.

Advantages of Multiple Index Price Book.

A SPECIAL feature of the books is the arrangement of the index characters, which, instead of being alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the first two or three letters of the names of Hardware articles as shown above. The ease and convenience with which the books can be used is indicated in the following examples, taken from Book F:

For Augers,	turn to	AU	For Chisels,	turn to	CH _U	For Iron,	turn to	IRO
" Parers, Apple	"	PA _R	" Cutlery,	"	CUT	" Irons,	"	IR _S
" Saws,	"	SAW	" Cartridges,	"	CAR	" Shovels,	"	SH _O
" Pumps,	"	PUM _N	" Rules,	"	RUL	" Grindstones,	"	GRI
" Bits,	"	BIT	" Locks,	"	LO	" Stones,	"	STO

Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion.

It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for any overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

Hardware Classification.—A pamphlet containing a classification of the leading Hardware articles is furnished with the price books.

Standard Lists.—In connection with these price books a set of *The Iron Age* STANDARD HARDWARE LISTS can be used with great advantage. Price 25 cents.

These price books, which have been prepared by R. R. Williams, Hardware Editor of *The Iron Age*, are presented to the attention of Hardware men in the confidence that they will be found a most valuable aid in keeping track of prices.

Sent, Post-paid, on Receipt of Price, by

DAVID WILLIAMS, Publisher, - 96-102 Reade St., New York.

THE STEEL AND IRON IMPROVEMENT CO.,

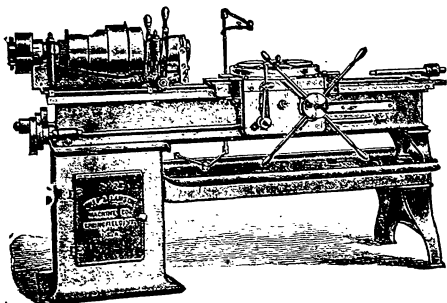
Controlling the Adams-Blair Process and other Steel and Iron Patents.

High Grade Open Hearth Steel produced by the Adams-Blair Process at less than the Cost of BESSEMER Steel.

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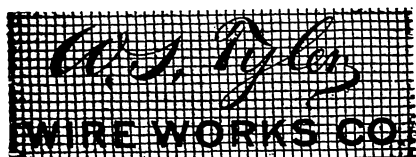
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HAVE YOU A
FLAT TURRET LATHE ?



If not send for

RAPID LATHE WORK.
JONES & LAMSON MACHINE CO.,
SPRINGFIELD, VT., U. S. A.



MANUFACTURERS OF

"The Tyler"

Galvanized Poultry Netting.

All Widths and Meshes Carried in Stock,

W. S. TYLER, Pres. PROCTOR PATTERSON, Sec. and
Treas.

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221 PEARL ST., (Corner Platt St.,) NEW YORK.

Assays of Ores, Metals and Metallurgical Products of every description.
Analysis of Water, Ores, Minerals, Metals, Fuel, and Natural and Industrial Products generally.

PRINTED PRICE-LIST ON APPLICATION.

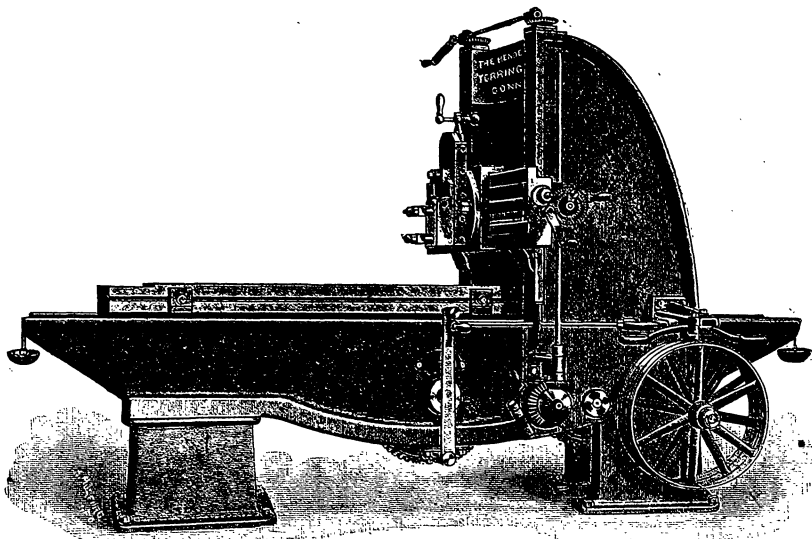
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The Pittsburgh Reduction Co.,

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Offer Aluminum guaranteed equal in purity to the best in the market, at lowest rates obtainable.

ALUMINUM SHEET, WIRE, AND CASTINGS.



Iron Planers at Reduced Prices.

We have on hand a few new planers of this pattern, and in order to dispose of them quickly, we would make a good reduction in price of same. The sizes are 16 inch, 22 inch, 24 inch and 27 inch. If you are in need of a good planer write us for prices on these.

The Hendey Machine Co., Torrington, Conn.

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SPECIAL MACHINERY?

CORRESPOND WITH

THE NEWARK MACHINE TOOL WORKS,

NEWARK, N. J.



The season's records are filled with the feats of Johnson, Rich, Rhodes, Tuttle, Murphy, Knisely and a score of others. On STEARNS wheels they won prizes and places and altered figures on the blackboard day after day. Who can say that this year's winners will be winners next year?

WHAT THEY

CAN DO

YOU CAN

DO, TOO.

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ARE YOU HERE 'TO MAKE MONEY?

IF SO, THE PRICES WE ARE MAKING ON
OIL HEATERS AND GAS STOVES

WILL INTEREST YOU.

B. & B. Stoves are the Leaders.

B. & B. Combination Oil Heaters and Cook Stoves are a great success, as proven by the many testimonials received from all parts of the country.

Every Stove is mounted on rollers, and can easily be moved from room to room. They can be used in place of a range in the kitchen or in place of a base-burner in the parlor. They are thoroughly well adapted to fill all requirements, combining as they do all the qualities of a first-class Oil Heater and an elegant Parlor Cook Stove.

If you happen to have one of them upstairs, the tank can easily be removed and taken down to the kitchen to be filled, and again replaced in the Stove.

Those who have used the old style Stove with tanks fastened in them as tight as if cast in the iron will appreciate this feature. They can be fitted with our 2-hole, 3-hole or 4-hole Extension Tops for regular 8-inch ware. We want your trade, and if you will give us a chance to quote you prices we will have it.



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The standard by which the merits of a Freezer are gauged is, how near it comes to being as perfect as the

WHITE MOUNTAIN ICE CREAM FREEZER.

It always has been, and is still, the best. Try them.

Manufactured by The White Mountain Freezer Co., Nashua, N. H.



THE OLD RELIABLE STANDARD FREEZER

has the reputation of being the BEST ICE CREAM FREEZER ever introduced. STRENGTH, DURABILITY, NEATNESS AND EFFICIENCY are prominent points in the manufacture. Full Size Can, CEDAR TUB, Detachable Hinged Crossbar, Self-adjusting Vibratory Scraper, etc.

Write for Illustrated Circular, Price-List and Discounts of STANDARD, GOOD LUCK, MODEL and MACHINE Freezers.

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THE "New" Keystone Beater,

FOR
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EGGS.

MIXING

BATTERS, DRINKS,
SAUCES, ICINGS,
POWDERS, ETC.

CREAMING

MELLOW FRUITS,
BANANAS, PEACHES,
BERRIES,
BUTTER & SUGAR.

No. 20 for Family Use.

JAR ENTIRELY COVERED.

No more Spattering.

CAN BE USED ANYWHERE.

Standing or Sitting.

ALWAYS READY FOR USE.

Nothing to be fixed.

SIMPLY PERFECT.

No. 20.—Jar holds 1 quart level full.
Complete Machine securely packed in one single package.
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Manufacturers of Hardware Specialties for Household use
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Write for latest list and catalogue free. **Syphs, Overlands and Ridges** of our own manufacture on favorable terms to the trade; **Western Wheel Works' Cycles** of which we are largest Western jobbers at Bed-Rock prices. Positively 20 to 60% saved on many styles. The low prices and high quality of our goods will surprise you. Don't miss it. Write now. Cycles sold on easy payments.
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Manufacturers, oldest and largest jobbers in U. S.

COVERT'S SELF-LOCKING, GATE AND DOOR HOOK.
POSITIVELY PREVENTS BEING UNHOOKED FROM THE OPPOSITE SIDE THROUGH CRACK OR NARROW OPENING
MADE IN TWO SIZES
4 AND 6 INCH XC PLATED.

Call for Our Banner Bolt Snap:

This snap has many important advantages over other makes of Bolt Snaps, viz.: It is lighter, the spring is entirely covered and protected from foreign substance and freezing, and is lower in price.

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ON'T

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NEW GRAVITY BLIND HINGES of Wrought Steel

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CLARK'S BEST QUALITY SCREW DRIVERS.



Four Drivers and one Handle; all interchangeable; are hardened and tempered all over; made of best stock, and finished first-class.

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*You take no risk on the quality.
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**Sand
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HAIR FELTING for covering Boilers, Steam and Water Pipe, and lining Refrigerators.

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182 LAKE STREET, CHICAGO.

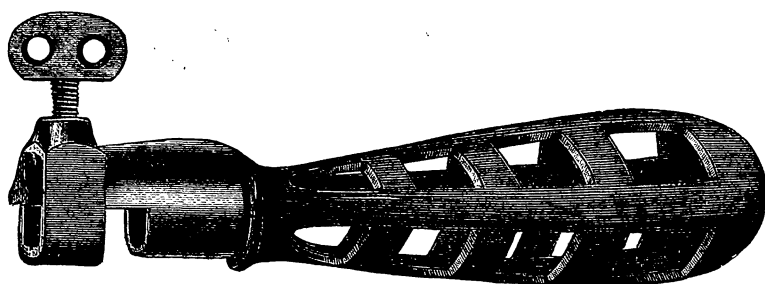
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Single
and
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Handle and Blade Formed in one piece.
Always Clean. Indestructible.
No Rivets to Wear Loose.
No Wooden Handle to Shrink, Swell, Loosen Split, or Fill with Rancid Grease.

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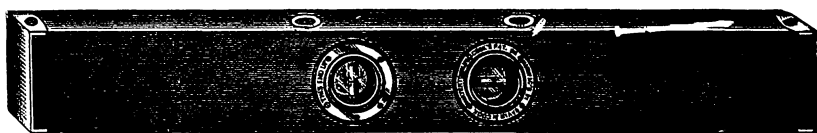


UNIVERSAL FILE HANDLE.

This malleable iron File Handle is five inches long and has a Japan finish. The Thumb Screw, as seen in the cut, is forged steel. Weight of handle five ounces. It is strong, durable, and will hold perfectly files of all size and shape tangs from a 15 inch mill file to the smallest size in use. It will hold equally well Twist Drills, Gimlets, Screw Drivers, Auger Bits, and all tools with shanks less than $\frac{3}{8}$ of an inch square.

It will also answer most of the purposes of a Hand-Vise, and will sell at sight anywhere Price, per dozen, \$1.80.

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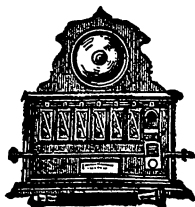
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PATENT
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Made in Wood and Iron. Every Level Fully Guaranteed.

Inquire at your nearest hardware store for them. If not in stock, send to

TAKE NO
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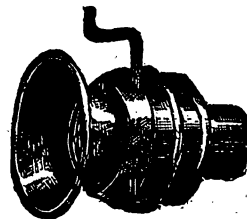


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204 FULTON STREET, NEW YORK,
Manufacturers of

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MECHANICAL AND PNEUMATIC ANNUNCIATORS
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Complete outfits of Speaking Tubes, Whistles
Electric, Mechanical and Pneumatic Bells. A full line
always in stock. Send for new catalogue. Factory,
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A complete line of more than 1000 list numbers exclusive of our old
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THE PEOPLE ask for

MAKES FRIENDS and MONEY, and
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The people ask for

LePage's Liquid Glue,

And the people are right.

It is the strongest and best glue made. It has been
imitated, but never equalled. Be sure to get what you
order and ACCEPT NO SUBSTITUTES.

Our name is on every label

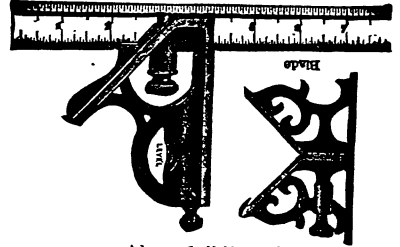
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New York Office, 95 Reade and 113 Chambers Streets.

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CHAPLIN TRY AND CENTRE SQUARE.



Also a full line of

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ATHOL, MASS., U. S. A.

ATHOL MACHINE CO., Selling Agents.

NONPAREIL Ratchet Wrenches.

Made of best forged Tool Steel; are
easily and readily adjusted and controlled. Can be made reversible instantly without removing from their work by throwing over the lever in slot of the handle.

The Set of Combination Tools No. 1
includes the wrench, two sockets, one
for screw-driver, bit or reamer shank,
with wood handle, and one socket



for drill shank and feed nut. The
jaws on this wrench open from 3-16
to 1 1/4 inches.

Send for Illustrated Circular
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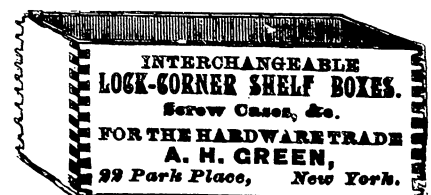
The Keystone Mfg. Co.
312 Terrace, Buffalo, N. Y.

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WE MAKE ONLY

The Very Highest Grade
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H. H. MAYHEW CO., Shelburne Falls, Mass



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Branch Warehouses: 85 and 87 John St., New York; 197 Lake Street, Chicago, Ill.

THE OLDEST AND MOST EXTENSIVE MANUFACTURERS OF

Pumps, Hydraulic Rams, Garden Engines,

Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps and other Hydraulic Machines in the World.

DOUGLAS' DIAPHRAGM PUMPS, "Loud Patent."

A LARGE CAPACITY AND EASY WORKING PUMP FOR

Water Works, Sewer Contractors, Foundation Builders, Mines, Quarries,

Fig. 209.

Fig. 381.

Fig. 145.

or wherever it is desired to raise a large quantity of water by
hand power.

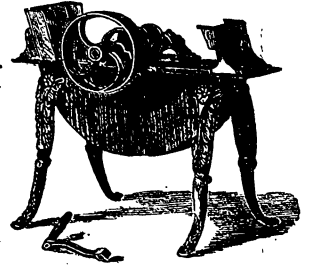
The pump has large valves (accessible by hand), and will pump water containing sand, gravel, sewage matter, &c., without choking or any perceptible wear.

CAPACITY

from 3,000 to 4,500 gallons per hour.

These pumps are simple, durable and low priced.
Made either as shown in cut for Hose or for IRON Pipe Suction underneath.

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MANUFACTURERS OF
ARTESIAN WELL
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PUMPS
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THE LARGEST PUMP WORKS
EXCLUSIVELY
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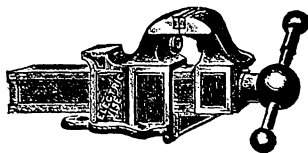
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Ashland Pump and Hay Tool Works.

The New York Safety Dumb Waiter,
"The Manhattan Dumb Waiter,"
"The Improved Humphrey Hand Elevator,"
Made specially to be sold by Hardware Stores. Thousands in use. Catalogues on application.

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NEWARK, NEW JERSEY.
Formerly of Poughkeepsie, New York.

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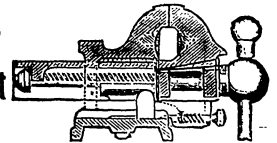


Patented Dec. 27, 1892.

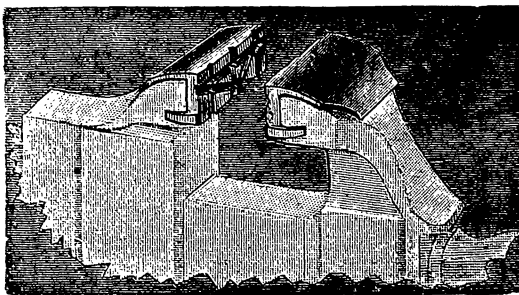
IT HAS QUALITIES THAT ARE
UNDISPUTED.

Rapid, Active, Prompt

One movement in and out, one
turn of the hand and the
work is secured.



The Capital Machine Tool Co., AUBURN, N. Y.



BINGHAM PATENT VISE JAW CAP

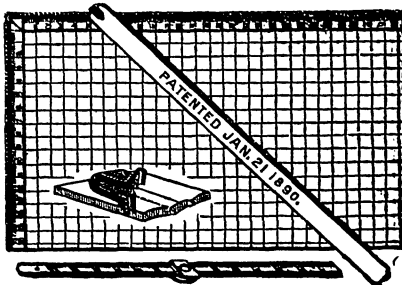
Will Fit any Kind of Vise.

For protecting finished work. Will
hold finished rods of any shape without
injury.

3 1/2 inch..... per pair, 40 cents.
4 " " " " 50 "
4 1/2 " " " " 60 "

PRENTISS VISE CO.

44 Barclay St., New York.



The Canton Glass Board.

Cuts any Fraction of an inch by Eighths.

Unequaled for accuracy and quick work in cut-
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—ALSO—

IMPROVED TRAMMEL RULE for Cutting Circles

From 3 inches up to 48 inches, Segments,
Gothic Shapes, &c.

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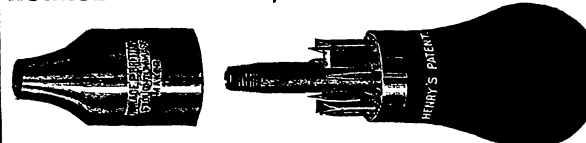
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**HENRY'S PATENT COMBINATION
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AND OTHER TOOL SPECIALTIES.



The Combination Haft contains
six Brad-Awls, one Chisel, Screw
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SHIFTABLE REVERSIBLE
BRACKETS
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THE KNAPP & COWLES MFG. CO.,
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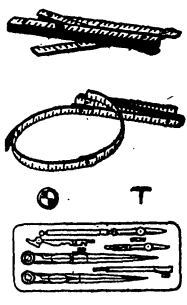
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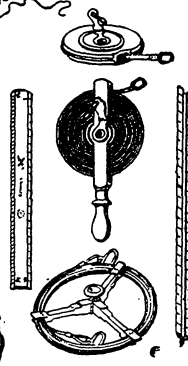
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FACTORIES: HOBOKEN, N.J.

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SUPERIOR QUALITY, LATEST IMPROVED. GREATEST VARIETY.
STEEL • METALLIC • LINEN • POCKET TAPES.
EXCELSIOR BAND CHAINS FOR SURVEYORS, LAND CHAINS, &c.

K & E CO FOLDING POCKET RULES.
NO WARPING, NO SHRINKING, NO ILLEGIBLE JOINTS, NO BULK.
2 3 4 5 6 8 FOOT, ALSO WITH PATENT SPRINGS.

FLAT & TRIANGULAR BOXWOOD SCALES, BEST MADE.
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THE MAJESTIC.

Design Patented August 29th, 1893.



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— FOR —

CHAIN PUMPS,
(Kegler's Patent)

Are Giving Universal Satisfaction,

BECAUSE:

They do not rust and accumulate filth—always clean. Extreme lightness is combined with strength and durability. No freezing. No waste of water by reason of enlarged reservoir at top of tubing. No annoying wheel at bottom. Easy to handle. Tubing weighs less than 1/4 lb. per ft., is connected by couplings and can be attached to any make of curb.

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Steel Measuring Tapes.

Entirely new. Handle or crank when closed is perfectly flush with leather case. Opens by pressing button on opposite side and folds out double, giving increased leverage. Best and most convenient steel tape on the market. Fully guaranteed. Will send samples on approval. We carry a complete stock of our goods at our New York Office, 20 Murray St.


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No. 5. 6 in.



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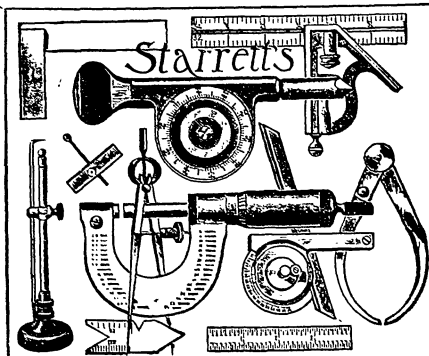
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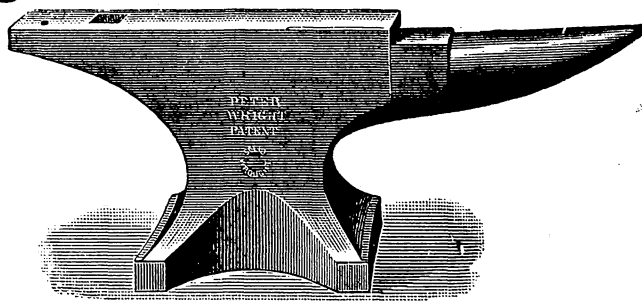
NEW YORK.

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Peter Wright's Patent Solid Wrought Anvil

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WRIGHT
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WROUGHT

Fac-Simile of Trade-Mark.



Fac-Simile of Green Label.

By Royal Letters Patent.

V.  R.

PETER WRIGHT'S
SOLID WROUGHT
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Made of Best Scrap Iron!
THE BICK FACE AND END ALL
IN ONE SOLID PIECE!

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SAWS

MANUFACTURED BY

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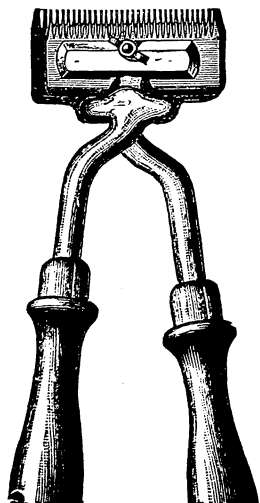
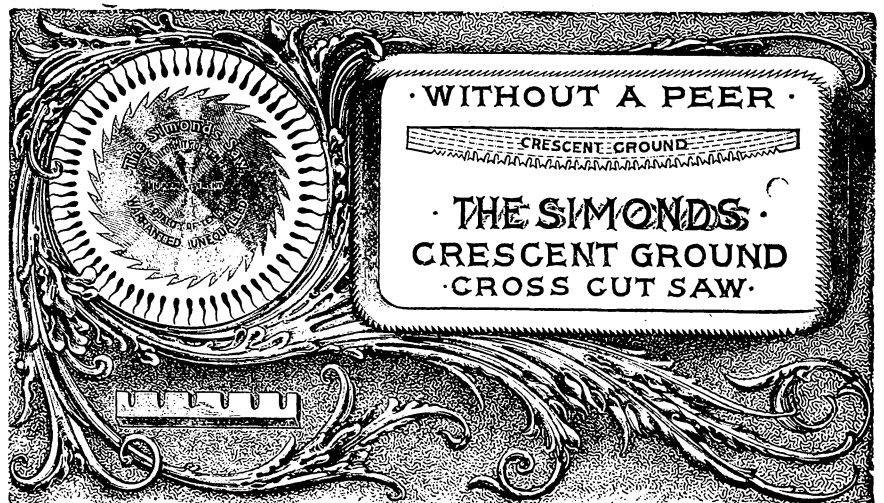
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1798.INCORPORATED
1891.

JOS. F. McCOY CO.,

26 Warren St., New York,

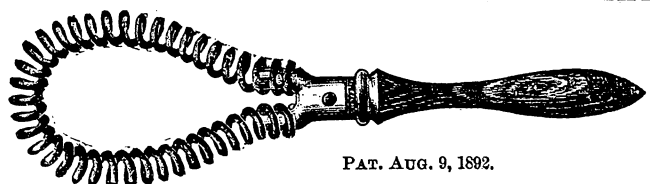
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Barber
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THE "BELL"
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Clippers.At prices to suit
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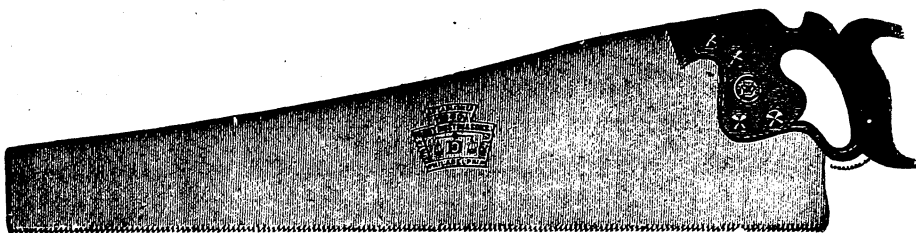
PEABODY & PARKS,
Manufacturers, TROY, N. Y.

"If you want a Saw it is best to get one with a name on it which has a reputation.
A man who has made a reputation for his goods knows its value as well as its cost and will maintain it."—HENRY DISSTON.

THE SAWS THAT LEAD THEM ALL

DISSTON & SONS' PATENT D-8 HAND SAW.

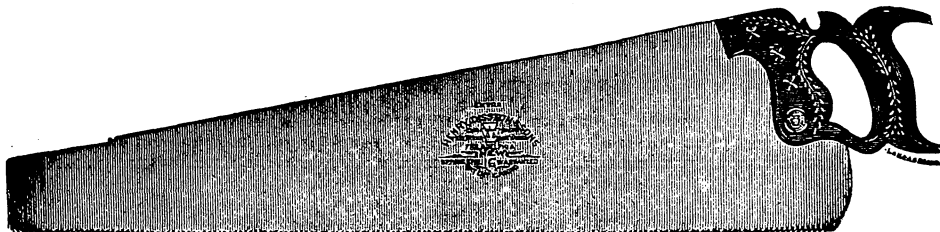
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SAW;"
HOW
TO
CHOOSE
IT,
AND
HOW
TO
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IN
ORDER,
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Free
on
Receipt
of
Name
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Address.



This Saw combines all the valuable improvements in Hand Saws that have been made by us of late. The first and most important is the hollow or skew back, the success of which can best be attested by the number sold. The peculiar shape of the butt or heel, coupled with the new method of fastening to the handle, give a full stroke of the blade without fear of catching or hooking in the work; and as the handle is put further on the blade you have a full stop on the proper point and a greater command over your Saw, by reason of being two inches nearer the point, which must give more power.

The Saw being let into the handle on a circle, has a perfect bearing, which, with the new screws, makes it stronger and almost impossible to work loose, and avoids the unsightly gap that is seen on the back of the old style handle. All the above features are patented.

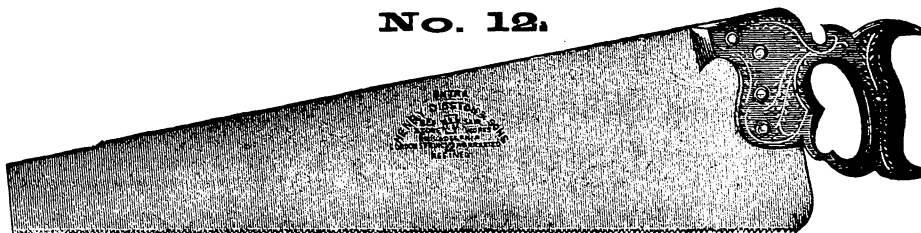
Our New No. 16 Premium Saw.



AN EXTRA FINE SAW IN EVERY RESPECT.

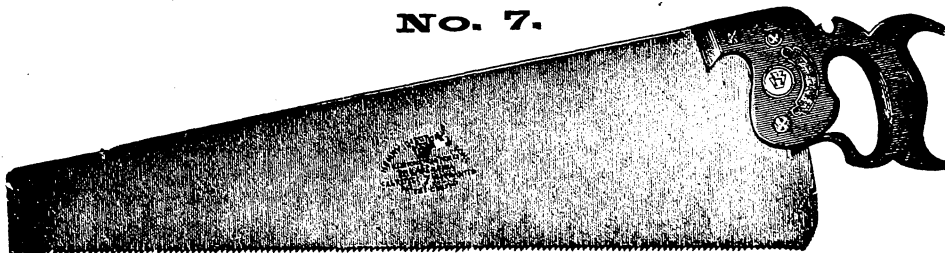
Having the Latest Close up Handle, Spring Steel Blade, Extra Thin Back, Finely Grained, with an Apple Handle and Four Brass Centennial Screws.

No. 12.



DISSTON & SONS' Extra Refined London Spring Steel, Selected and highly Polished Blade, Handle Carved and Polished, 4 Improved Brass Screws, the finest Hand Saw manufactured.

No. 7.



DISSTON & SONS' Cast-Steel, Warranted, Beech Handle, Polished Edge, 4 Improved Screws, Grained Blade.

"POCKET
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HAND
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Sent
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ASK YOUR DEALER TO ORDER THEM FOR YOU.

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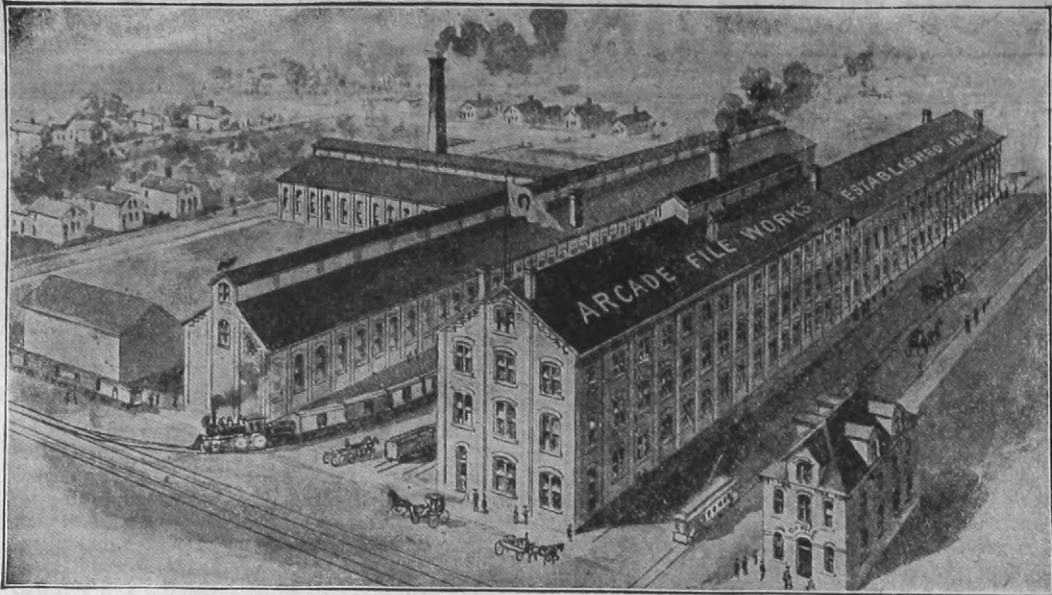
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THE BEST EQUIPPED FILE WORKS IN THE WORLD.

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HOLLANDS' OFFSET JAW VISE.

Specially adapted for drill press work where chucks can not be used and equally good for special or regular bench work.

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 Manufacturers of styles VISES.

Philadelphia, 1876.





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FIFTH and BERKS STS.

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For Superiority.



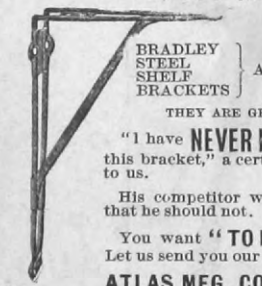


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THEY ARE GREAT SELLERS.

"I have **NEVER HAD A CALL** for this bracket," a certain dealer once said to us.

His competitor was taking good care that he should not.

You want **"TO BE IN IT"** this fall. Let us send you our catalogue and prices.

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Made of Wood
 No screws or nails used to work out and cut your shelving

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BEST

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STRONGEST TOOTH.

"TROJAN" HORSE RASPS.



BANKER & WHITE,

(Troy File Works.)

LOWEST IN PRICE.

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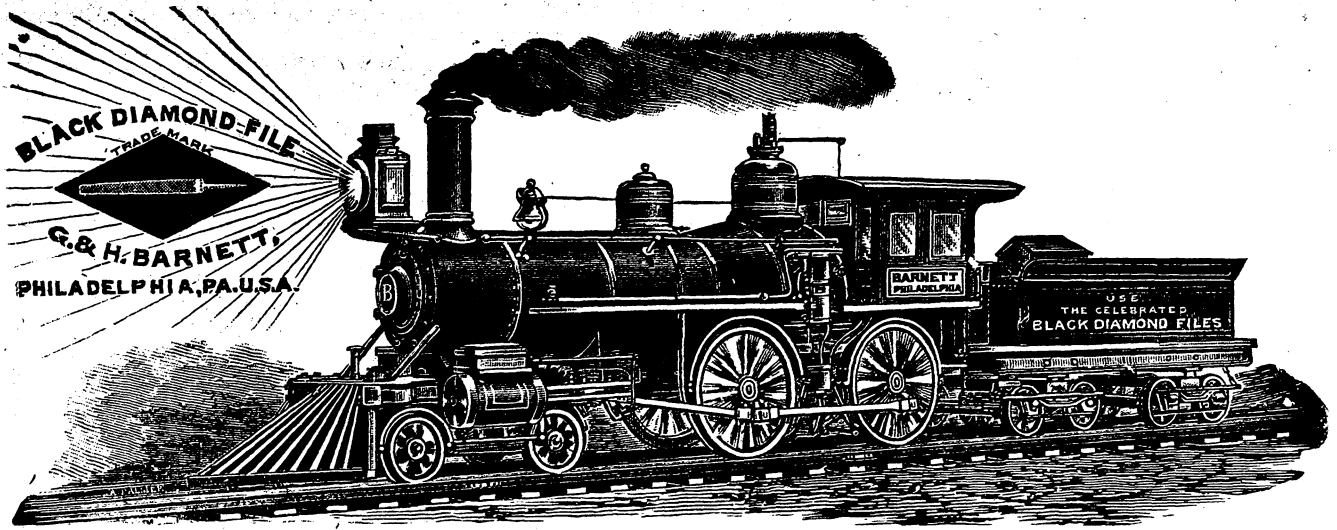
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The Taintor Positive Saw Set.

Mechanics are now inquiring for this tool, and Hardware Dealers should have them in stock, or at least have a sample.

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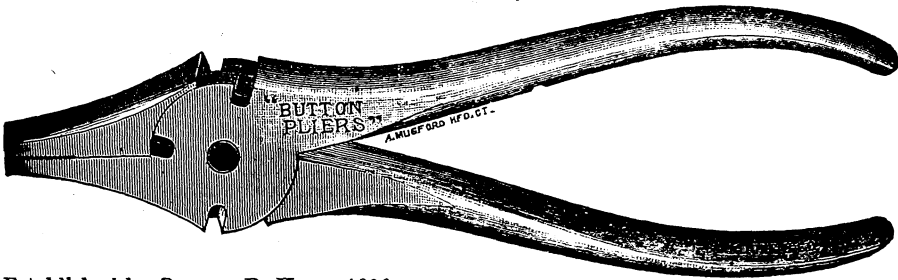
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TAPER TAPS, HAND, NUT and SCREW
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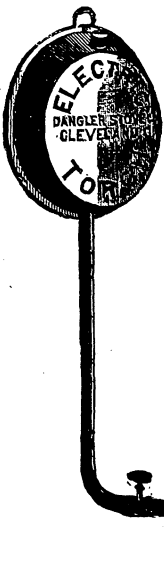
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THE LARGEST AND MOST COM-
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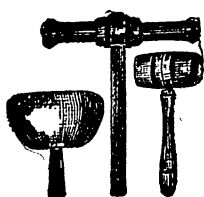
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NEW CONCRETE MIXING MACHINES.

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Description of General Forgings, Dimpfel Blow er
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RATCHET BRACE.



POINTS:

Fewest parts of any.
No pins to cut.
The finest finish.
Oil tempered Jaws.
Will hold twist drills.
Double the strength.
Strain equalized.
Steel clad head.
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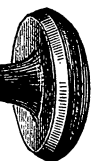
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American Screw Co.'s Screws, Bolts, Rivets, &c.

Oliver Ames & Sons' Shovels.

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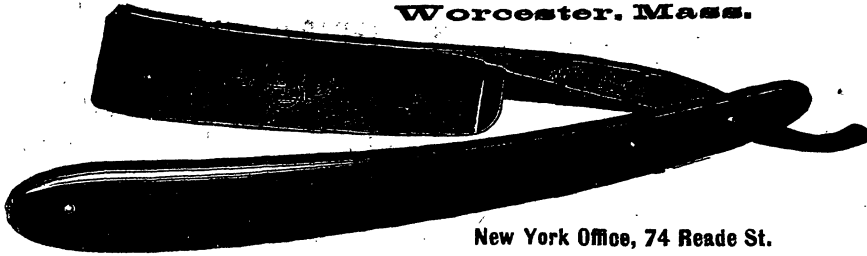
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THE BEST IN THE WORLD.

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J. R. TORREY RAZOR CO.,

Worcester, Mass.



New York Office, 74 Reade St.

Our Razors have become the standard for excellence and are no higher in price than the foreign. We manufacture and carry in stock more than 200 styles. Send for illustrated catalogue.

THE STANDARD.

BUCK BROTHERS,

MILLBURY, MASS.

The Most Complete Assortment in the U. S. of

Shank, Socket Firmer and Socket Framing
Chisels.

PLANE IRONS.



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CAUTION.—Buyers should be on their guard and not have inferior goods palmed on them by unprincipled persons who represent them as our make. Our tools are stamped "BUCK BROTHERS," and our labels have on our trade-mark also, "Riverlin Works."

Established 1825.

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Tailors' Shears, Trimmers, Scissors, Tinnors' Snips, etc.

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HIGHEST AWARD PARIS EXPOSITION, 1889.



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MANUFACTURERS
OF
Coopers', Carpenters' and Ship Tools, Plane Irons,
Cleavers, &c. Full Line Chisels.

EDGE TOOLS.



FOR THE CORRECT MODE IN SHAVING
USE CURLEY'S PATENT
SAFETY

GUARD

RAZOR

THIS improvement permits CORRECT SHAVING, therefore no irritation is caused, and the most inexperienced can shave with perfect safety.

We also carry the largest line in the United States of CUTLERY of every description.

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ACME SHEAR CO.,

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Commission Hardware,

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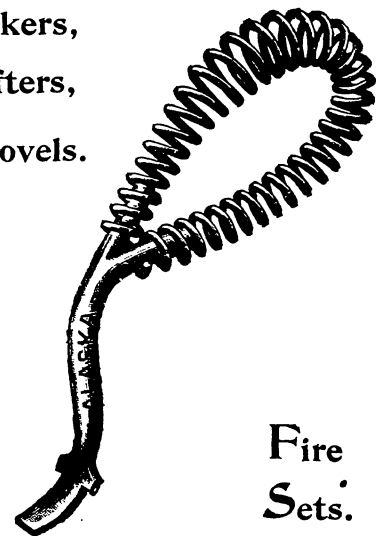
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ALWAYS COLD.

Stove Trimmings.

Pokers,
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Fire
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First-class Jobbers in Hardware.

Made under Gaitly Patents and only by

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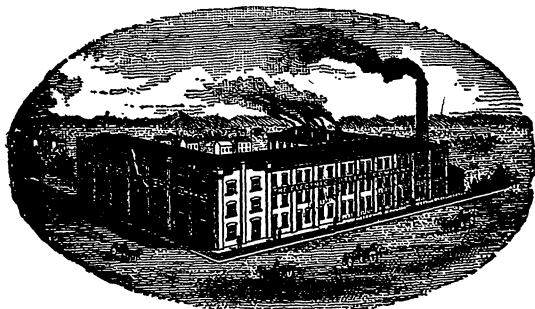
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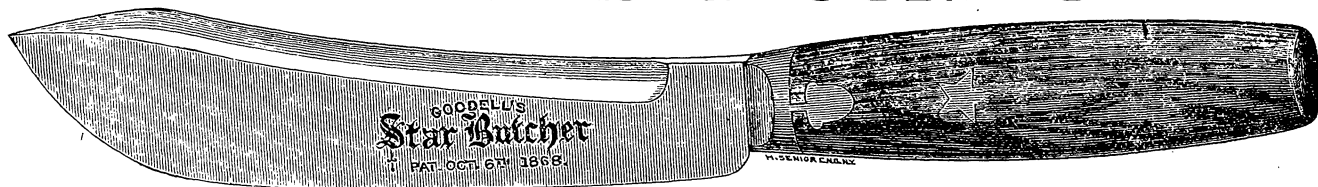
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TABLE CUTLERY, BUTCHERS' CARVERS, PLATED GOODS, &c.

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**THERE IS NOTHING NEW
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IT IS GROUND SHARP.**



WE DON'T KNOW HOW TO IMPROVE IT.

Blade is made of steel especially prepared for the purpose, and it is made just right; finish excellent; shape unsurpassed; the handle just fits the hand.

GENERAL APPEARANCE IRREPROACHABLE.

Made in sizes from 5 inch to 8 inch; a strictly first-class butcher knife at a moderate price.

WE HAVE OTHER BUTCHER KNIVES,

4½ to 14 inch blade, that will cut as well, for less money. Also Table Knives and Forks, Carvers, Butcher Steels, Bread Knives, Cheese Knives, Butter Spades, Apple, Kitchen, Putty, Cigar, Shoe Knives, &c., &c., in great variety. We aim to make the best and sell at reasonable prices.

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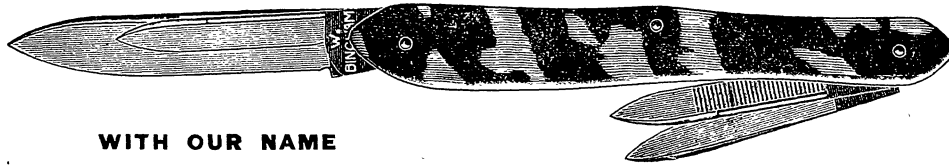
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IS THE BEST
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That money
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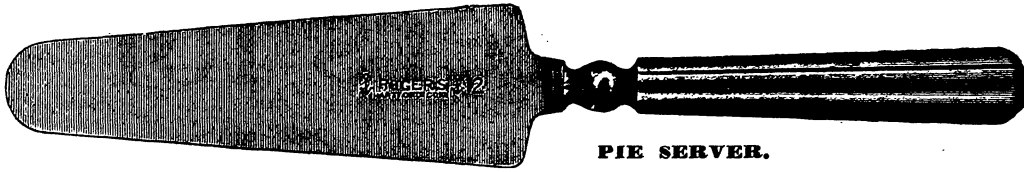
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THAN THE



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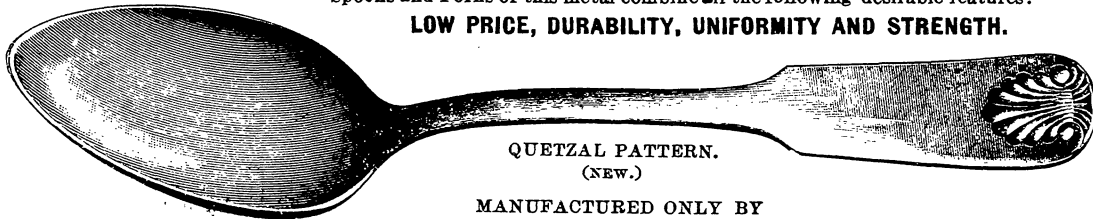
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AZTEC COIN METAL

MADE INTO SPOONS AND FORKS.

Spoons and Forks of this metal combine all the following desirable features:

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AZTEC COIN METAL
has no plating to
wear off. Made
of solid metal.
Easily kept clean.



outs, Kennel Chains, &c.; also cut to lengths for manufacturers' use.

The cut represents the exact size of 6/0.

Thirteen Sizes made, 6/0 being the Largest.

The Bridgeport
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Traces, Cow Ties, Tie-FACTORY AT
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Warranted Better than the Best

ENGLISH ANVIL

Face in one piece of BEST TOOL CAST
STEEL, PERFECTLY WELDED, per-
fectly true, of hardest temper, and never
to come off or "settle." Horn of tough
untempered steel, never to break or bend.
Only Anvil made in the United States fully
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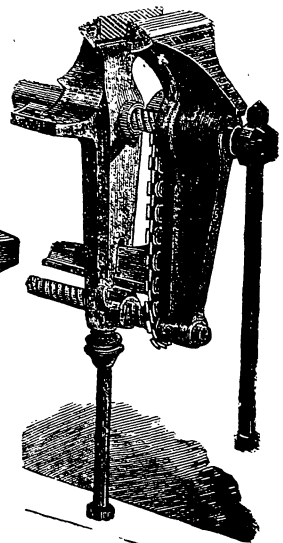
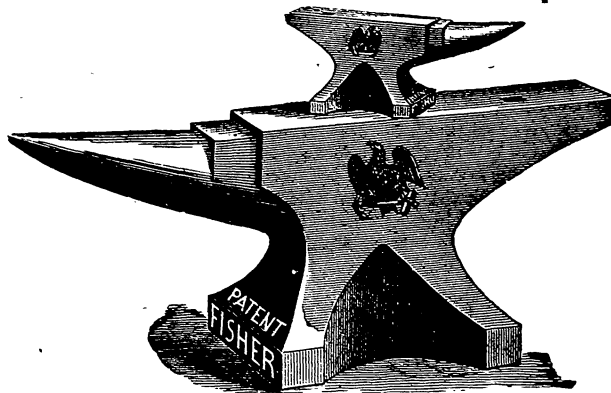
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IS FULLY WARRANTED STRONGER
THAN ANY OTHER LEG VISE, AND
ALWAYS PARALLEL. Is the best Vise
for Machine Shops and Blacksmiths, and
for all heavy work. ACCURATE AND
DURABLE. Send for Circular.

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A practical means of rapidly reach-
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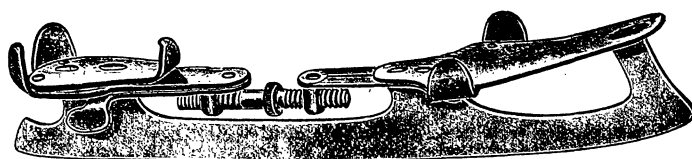
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Headquarters for Winslow Skates.

Obtain our Prices before Ordering Elsewhere.

1893-94 Catalogue Now Ready.

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The most extensive Skate Factory in the World.

Just Published.—THIRD REVISED EDITION.

THE IRON AGE STANDARD HARDWARE LISTS

FOR USE IN PRICE BOOKS.

Compiled by R. R. WILLIAMS, Hardware Editor of The Iron Age.

This pamphlet contains the principal standard Hardware price-lists in as clear and compact an arrangement as possible, so as to permit their being advantageously cut out and inserted in the price book. In order to make them adapted to this use they are printed on thin and tough paper of fine quality and on only one side of the paper.

Saucepans and Round Boilers.

Ptns.	Plain	Turled.	Tind or En'd.
1	\$0.30	.35	.39
1½	.32	.37	.44
2	.35	.39	.48
3	.42	.47	.56
Quarts.			
2	.50	.56	.63
2½	.53	.59	.68
3	.55	.62	.73
4	.60	.68	.84
5	.65	.75	.96
6	.70	.81	1.11
7	.75	.84	1.21
Gallons.			
2	.85	.96	1.31
2½	1.05	1.18	1.56
3	1.20	1.35	1.70

Wrenches.

Inches.	6	8	10	12	15	18	21
Black...	\$9.00	\$10.00	\$12.00	\$14.00	\$24.00	\$30.00	\$36.00
Bright..	10.00	11.00	14.00	16.00	26.00	32.00	38.00

Stove Hollow Ware.

POTS, KETTLES, ETC. (CAST IRON.)

No.	6	7	8	9	10	11
Pots.....	\$0.65	.75	.85	1.00	1.25	1.75
Kettles.....	.55	.65	.70	.85	1.00	1.40
T Kettles.....	.75	.80	.90	1.00	1.25	....
Spiders.....	.27	.39	.35	.40	.50	.60
Gridles Round	.22	.25	.27	.30	....	....
" Long..	.40	.50	.60	.75	....	....

SCOTCH AND YANKEE BOWLS.

No.	1	2	3	4	5	6
Scotch Bowls..	\$0.35	.40	.45	.50	.60	.70
Yankee Bowls.	.35	.45	.55	.65	.75	.90

The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ¼ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

Some merchants use this pamphlet for reference, checking off invoices, etc., as it gives the leading lists in a more convenient form than they can otherwise be obtained. The lists are, however, intended primarily to be cut out

Glue Pots.

No.	4/0	5/0	6/0	7/0	8/0	9/0
4/0....	\$4.50	5.00	5.50	6.00	6.75	7.50
5/0....	5.00	5.50	6.00	6.75	7.50	8.25
6/0....	5.50	6.00	6.75	7.50	8.25	9.00
7/0....	6.00	6.75	7.50	8.25	9.00	9.75
8/0....	6.75	7.50	8.25	9.00	9.75	10.50
9/0....	7.50	8.25	9.00	9.75	10.50	11.25

and inserted in price books, and can be used in connection with any of The Iron Age Hardware Price Books.

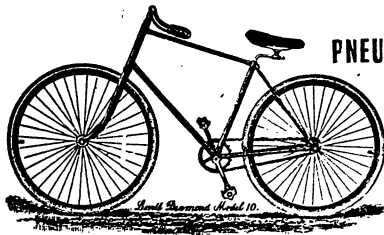
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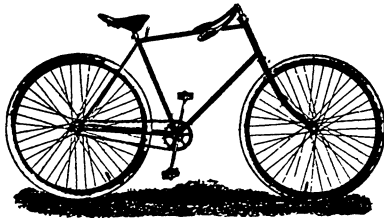
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PNEUMATIC, CUSHION AND SOLID TIRES.
FOR LADIES AND GENTLEMEN.

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CYCLE CATALOGUE FREE.

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BICYCLE



MANF'TRS

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MOST COMPLETE LINE MADE.

OFFICE AND FACTORY:

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Properly Designed,
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Combining Strength,
Durability and
Perfect Qualifications.
Such are the

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Wholesale Hardware.

Office, 35 Barclay St. Warehouse, 40 Park Place, New York.

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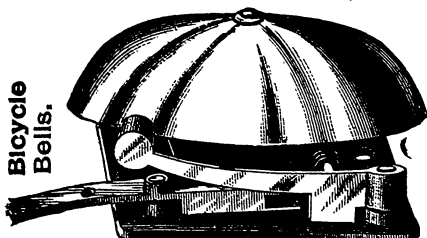
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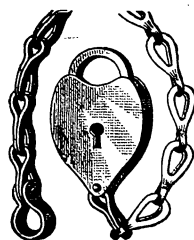
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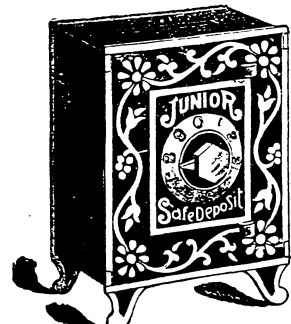
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JUNIOR Retail for . . . 25 cts.
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The Largest Combination Lock Banks for
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20 OTHER STYLES.

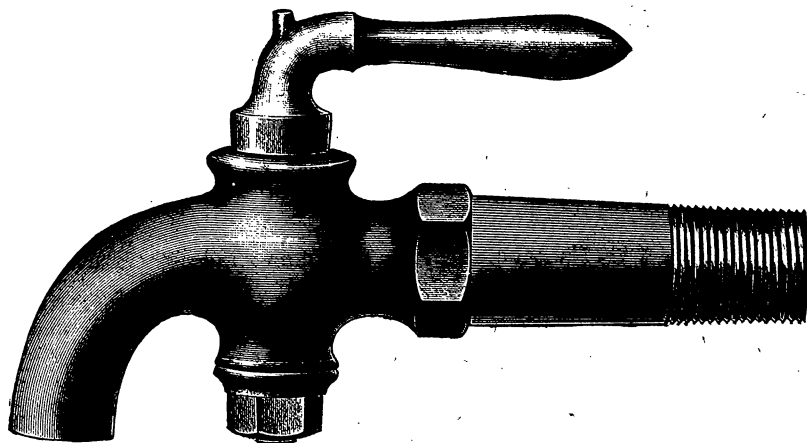
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BRITANNIA SPOONS
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Standard Petroleum Oil Faucets.



These Faucets are made from the best Refined Iron, with Solid Brass Key, and are fully warranted. The bearing is longer than in the ordinary faucet, making them less liable to break. Made in following sizes.

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SCREW SHANK,	No. 13	No. 14	No. 5	No. 6	No. 7
TINNED "	No. 013	No. 014	No. 05	No. 06	No. 07
LIST,	\$6.75	\$8.25	\$9.00	\$10.50	\$12.00 per Dozen.

Write to us for Discounts, we can interest you.

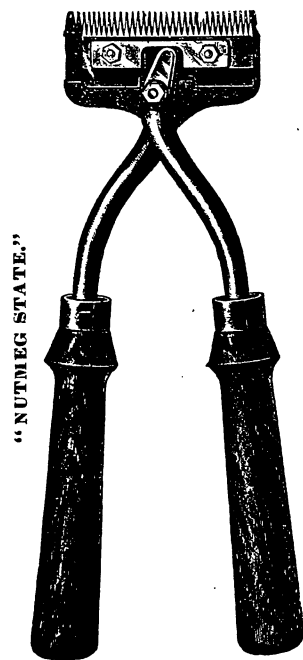
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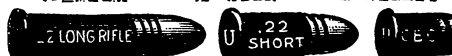
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Also Machinists' Tool Chests, empty. Illustrated Catalogue and prices furnished on application.

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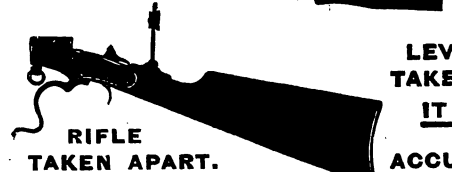


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Made for the 22 or 25 Rim Fire Cartridge.

WEIGHT, 4 1/4 POUNDS.



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TAKEN APART.

22-INCH BARREL.
LEVER ACTION LIKE SHARPS.
TAKEN APART IN TEN SECONDS.
IT IS SIMPLY IMPOSSIBLE
TO MAKE MORE
ACCURATE SHOOTING BARRELS
THAN ARE ON THIS RIFLE.

No. 17. Plain Open Sights.....\$12.50
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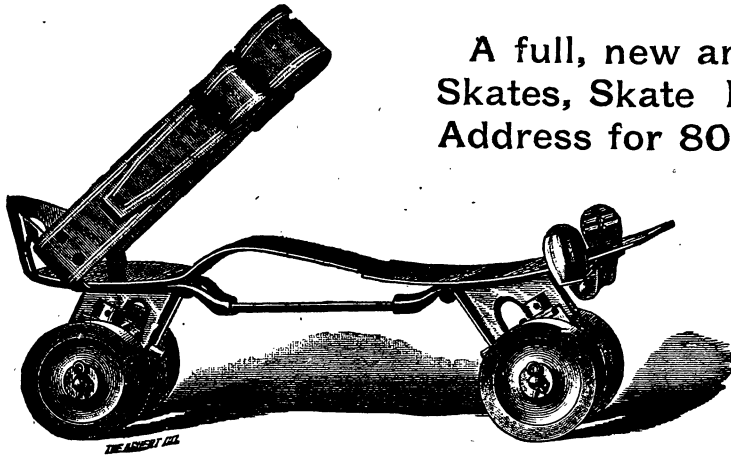
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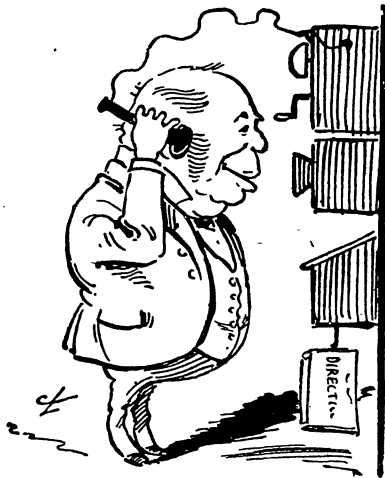
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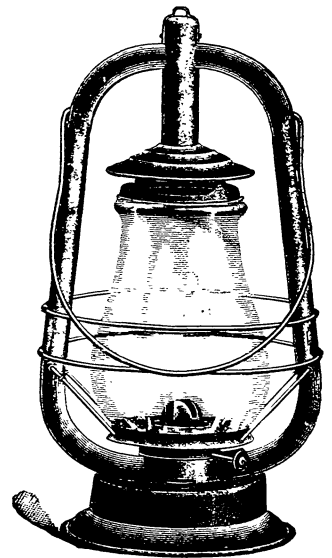
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Got it? Say! rush; am entirely out.
Yes, same old place.

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This GUN has rebounding locks and the barrels can be taken off and put on again without cocking the arm, and when cocked the hammers may be let down gradually, and without the full force of the blow. It is simple in construction, having very many less pieces than any other hammerless gun.

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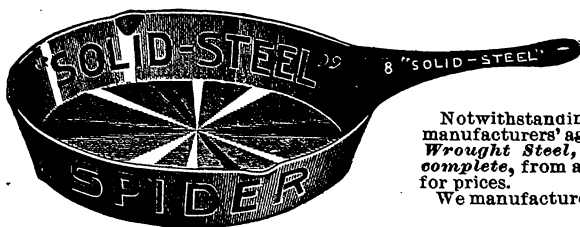
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PRICE VERY LOW.

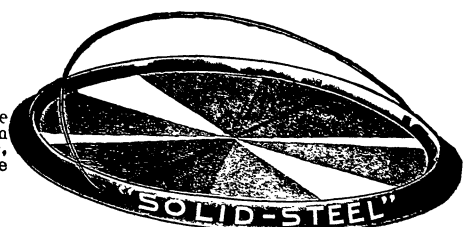
"SOLID-STEEL" SEAMLESS HOLLOW WARE.



BRILLIANT FINISH.

Notwithstanding the claims made by some manufacturers' agents, our spiders are made from Wrought Steel, Without Seams or Rivets, complete, from a single piece of metal. Write for prices.

We manufacture our own goods.

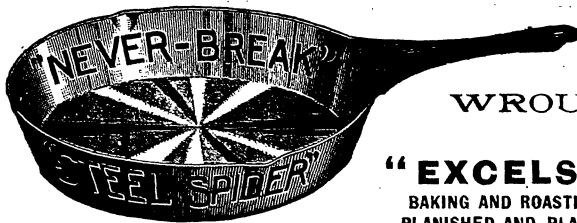


No Seams, no Rivets in "Solid-Steel" Ware.

Made either with Bails or Solid Handles.

The Cleveland Stamping & Tool Co., Cleveland, O.

We do Light and Heavy Stamping and Blanking. Also build Dies and Stamping Machinery.



"MIRROR POLISH," the only Perfect Plain Steel Finish.

"NEVER-BREAK"

WROUGHT STEEL COOKING UTENSILS.
MIRROR POLISHED-TINNED-PORCELAINED.

"EXCELSIOR"

BAKING AND ROASTING PANS,
PLANISHED AND PLAIN STEEL.

"PURITAN"

COOKERS, COFFEE POTS AND
OTHER SPECIALTIES.

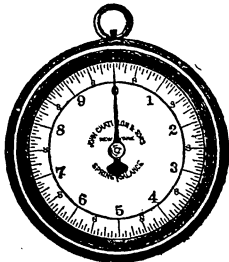
"IDEAL"

BRASS, BRONZE, NICKEL UM-
BRELLA STANDS, CUSPIDORS,
ETC., ETC., ETC.

THE BRONSON SUPPLY CO.,
CLEVELAND AND NEW YORK.

John Chatillon & Sons,

85, 87, 89, 91, 93 CLIFF ST., NEW YORK.



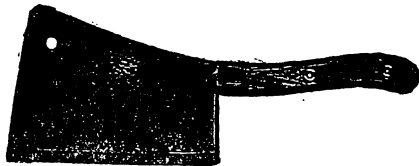
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1835.

SEND FOR
PRICE LIST.



Sole Agents for

Foster Bro.'s Butchers' Cutlery.



John Chatillon & Sons, N. Y.

GENUINE **MARTY** RAT AND
ALWAYS IN STOCK. MOUSE
TRAPS



THEY DO THE WORK.
Orders solicited. Prices on application.
BURDITT & WILLIAMS,
20 Dock Square, Boston, Mass.
—SOLE AGENTS AND IMPORTERS.—



No. 3

Globe Street Lamp.

Light your Streets and Driveways.
The S. G. & L. CO.

Tubular Globe Street Lamp

IS THE Best Street Lamp Manufactured.
Equal to the best Gas Light.
Will not Blow Out in the Strongest Wind.
Will not Smoke.
Will not Freeze.
Automatic Extinguisher.
Outside Wick Regulator.
Will Burn Four Hours for One Cent.

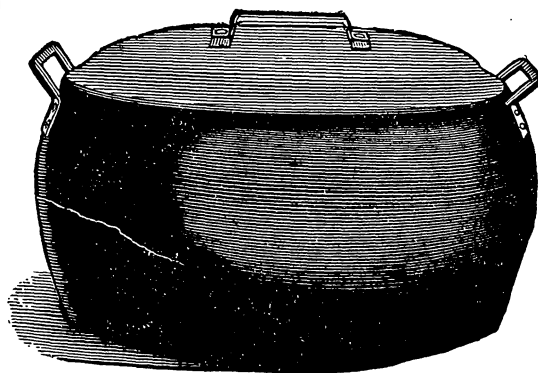
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STEAM GAUGE AND LANTERN CO.,

SYRACUSE, N. Y.

Western Branch, 25 Lake St., Chicago, Ill.

THE STUART & PETERSON CO., Burlington, N. J., U. S. A.



Hollow Ware,
Hardware Specialties,
Waffle Irons,
Coffee Roasters,
Icing Bowls,
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Glue Pots,
Chemists' Goods,
Spittoons,
Caldrons,
Jacketed Kettles.

HALL'S HUSKERS

FOR SALE BY ALL JOBBERS.

MADE BY

HALL & ROSS HUSKING
GLOVE CO.,

CHICAGO, - ILLINOIS.



Our trade-mark is on every pin we make.

JOHN LOYD, American Stamping Co.,

Manufacturers of

All Kinds of Tinware and Sheet
Metal Goods.

N. Y. Office and Salesroom, 104 & 106 John St.
Factory, 103 to 119 N. 3d St., Brooklyn, E. D., N. Y.

Machine Knives, Shear Blades,
Presses and Dies.

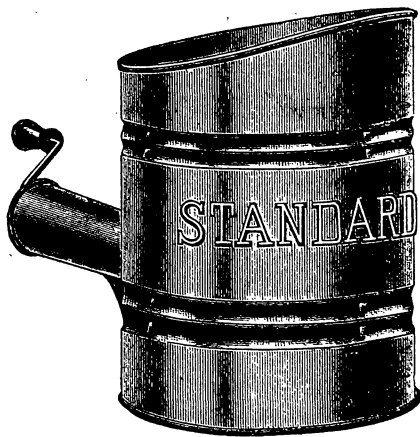
Nos. 558 to 562 Water Street, New York

The Enterprise M'f'g Co., of Pa.

Third and Dauphin Streets,
Philadelphia.MEAT
ChoppersEnough
said!

SOLD BY ALL HARDWARE DEALERS. SEND FOR CATALOGUE.

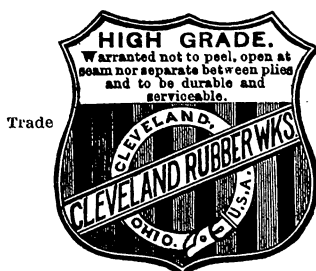
Dead Patents Create Competition and Improve Goods.

OUR Flour Sifters are made from Better Tin Plate,
are larger, and are models of Workmanship.We manufacture the most complete line on the
market and make a specialty of**‘THE MONARCH.’***The only Sifter made that has a bottom. Before buying get
our prices and circulars.*

W. H. SILLS, Manufacturer, 86 Lake St., Chicago.

“SHUT DOWN!” What's the Matter?**“BELT BROKE AGAIN!”**

“See here, Mr. Foreman, if you don't have fewer stoppages I'll—”
 “Stop, Mr. Proprietor, the fault is yours. Quit buying belts that crack, peel, open
 between plies, stretch and break and I'll give you a smooth run. You think it
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 pay the difference between good and bad
 belts ten times over. “by don't you buy
 Cleveland's ‘Shield High Grade,’ sold by Re-
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 tation, has been thoroughly tested, and is in
 use in all the large mills and elevators here.
 You take no chances on it. Besides, a strong
 warrantee is indelibly branded upon it, such
 as no manufacturer would dare put on a
 poor belt. You remember that threshing
 machine man, whose engine we repaired, said he had a Cleveland High Grade Belt in use over five years,
 and if it will stand such severe work, it certainly will ours.”



Trade

Mark.

LABEL INDELIBLY STAMPED ON
EVERY 30 FEET OF BELT.

We are the only manufacturers who indelibly stamp a warrantee on each and every belt (see copy of label) and it
 remains as long as the belt lasts; and who give a written guarantee (see fac-simile). Our threshing machine belts
 have made a wonderful record, and our endless belts have given splendid service, the splice being as strong as the
 solid part of the belt. Suction Hose for Portable Engines and all other purposes.

We Want Your Trade.
 Send for 60-page Catalog.
 Write for Prices and Samples

CLEVELAND RUBBER WORKS

OF THE MECHANICAL RUBBER CO., CLEVELAND, OHIO.

GUARANTEE.

We Guarantee our “Shield High Grade” Belt to be
 made of best long staple, 30 & 32-oz. cotton duck; To be
 the most durable, because it is made of best materials,
 by special machinery; To be the best selling belt, be-
 cause it has the best reputation, a cleaner record of long
 service, and because its warrantee is stronger, bolder,
 broader than any other, and is irrevocable, protecting
 both dealer and consumer. We further guarantee that,
 should any belt, under fair and reasonable service, fail
 or give out from any defect in material or manufacture,
 to replace same free of charge, on return to us.

Witness our hand and seal.

**Cleveland Rubber Works**

Of the Mechanical Rubber Co.

A Manufacture To Order
SPECIALTIES & NOVELTIES, PATENTED ARTICLES,
HARDWARE GOODS ETC., SMALL OR FINE MACHINERY.
SEND FOR CATALOGUE—CORRESPONDENCE SOLICITED
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 BLE, M.D. The author claims that the whole san-
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 scientific investigation. Much sanitary nonsense
 has been foisted on the people. He submits in-
 vestigations on air, water, soil, sewer gas, ceme-
 teries, public funerals, meat, milk, filth and fecal
 diseases, typhoid fever, yellow fever, cholera,
 diphtheria, epidemics, boards of health and vital
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 of diseases and the means of avoiding them sci-
 entifically. 1893. 462 pages, cloth.....\$2.00

For sale by DAVID WILLIAMS, 96-102 Reade st., N.Y.

P. & F. CORBIN,

New Britain, Conn.

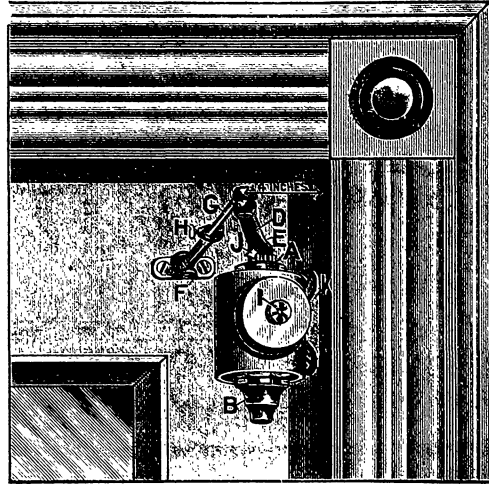
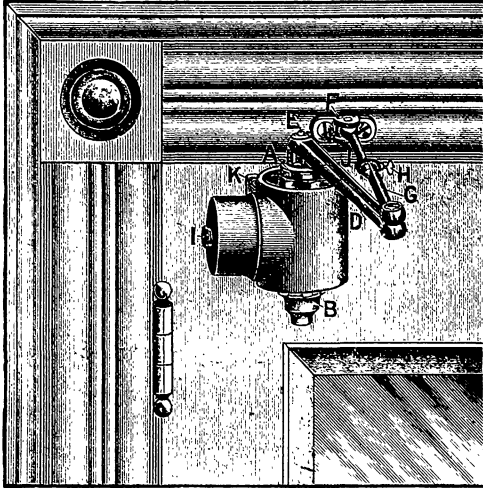
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—) MANUFACTURERS OF (—)

Easily
Adjusted
and Adapted
for all
Requirements.



Looks Well,
Acts Well,
Wears Well.

LIQUID DOOR CHECKS AND SPRINGS,

Fine Builders' Hardware. Wood AND Machine Screws.

Catalogues and Prices Furnished on Application.

Reliable Torches are
what you want.



Made either for Oil or
Gasoline.



These Torches are particularly adapted for use in Factories, Foundries, Machine Shops, Rolling Mills, Blacksmith Shops, Warehouses, &c. They make a strong white light, are free from smoke and are not affected by wind or rain. They are convenient and portable. These Torches can be run at an expense of about one-half cent to one cent per hour, burning a bright, steady light which is ten times greater than the light of an ordinary gas burner. Write us for prices. A liberal discount given to the trade. Manufactured by:
THE SCHNEIDER & TRENKAMP CO.
Nos. 479 to 497 Case Ave., Cleveland, Ohio

LIGHT YOUR DARK SHOPS CHEAPLY.

Give your men plenty of Light and they will do double work.

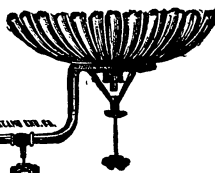


The Wall Torch has been used for several years as a means of illumination in Mills, Foundries, Machine and Car Shops, Tunnels, Street Stands, Band Stands, Smith Shops, etc.

While there are many cheap, inferior torches made which injure the sale of a good article, and condemn the Torch in general, our "Incandescent" Wall Torches are recognized as the best, and are now in use in the largest manufacturing establishments in the country giving **PERFECT SATISFACTION**, as is evidenced by the **DUPLICATE ORDERS** we receive from year to year.

They burn 150° Coal Oil, or 74° Naphtha, requiring a different burner for each.

In ordering be careful to state which is desired.



Price, for Single Torch, complete, \$2 each.

SPECIAL PRICE QUOTED FOR QUANTITIES.

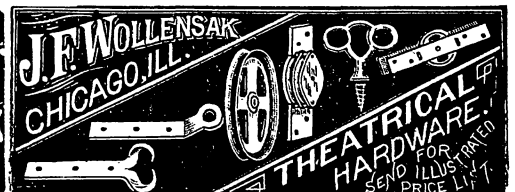
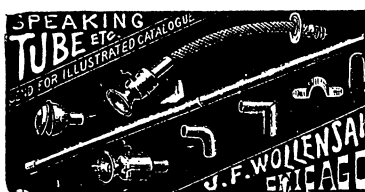
THE STANDARD LIGHTING CO.,

100 to 118 Perkins Ave.,

Cleveland, Ohio,



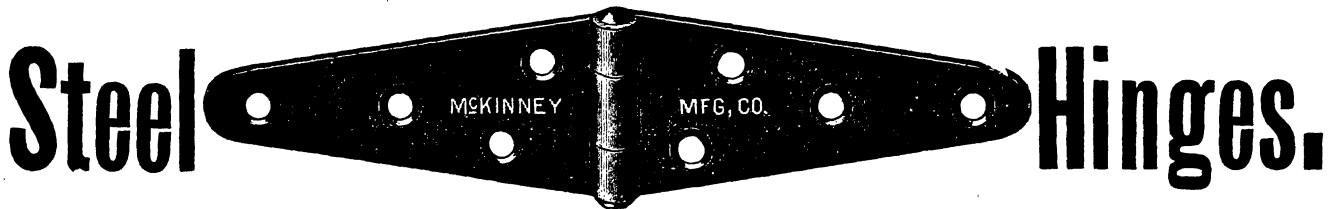
WM. KROGSRUUD,
Engraver and Die Sinker,
61 Fulton St., N. Y.
Manufacturer of
STEEL STAMPS
For Every Purpose.
Steel Letters and Figures.
Burning Brands, Stencils,
&c. Send for Illustrated
Catalogue.



WE CLAIM

That one pair of our Celebrated Steel Hinges will outwear two pair of the Flimsy Invention now being forced upon the attention of the trade.

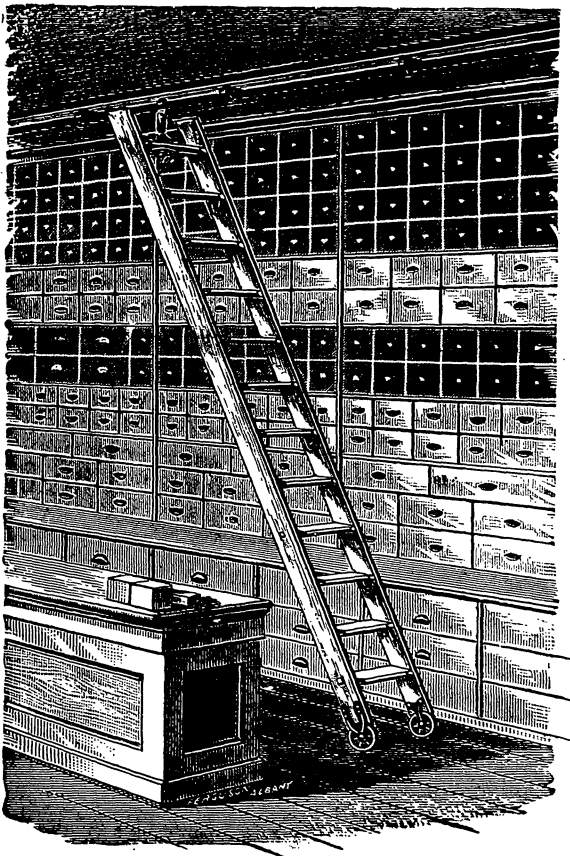
McKINNEY MFG. CO., ALLEGHENY, PA.



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"NONE BETTER."

THE "NOISELESS" STORE LADDER.

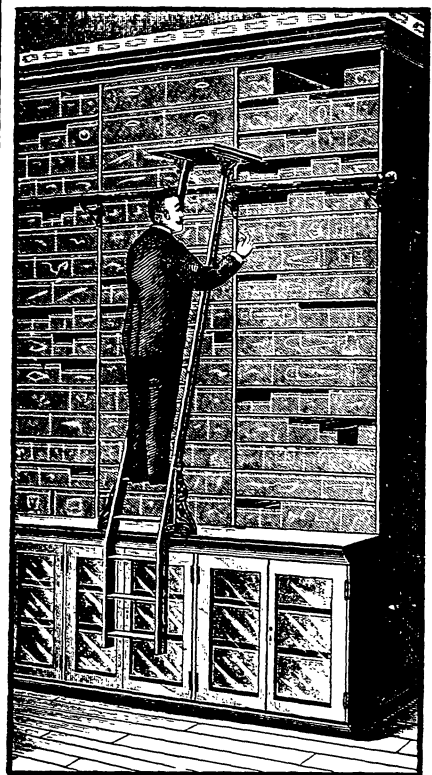


The latest and best. Perfectly noiseless. Not in appearance.

Manufactured by

M. CROISSANT,

ALBANY, N. Y.



THE BICYCLE STEP LADDER

The Newest, Neatest, Simplest, Easiest Operated and Safest Store Ladder made.

Ladders are not Suspended, but Supported from below on wheels. Move easier with operator on than others when empty. Highly finished, and very handsome. Made in different grades and prices to suit.

Send for illustrated catalogue and prices. See this space next week for other styles.

The Bicycle Step Ladder Co., 50 State Street, Chicago, Ills.

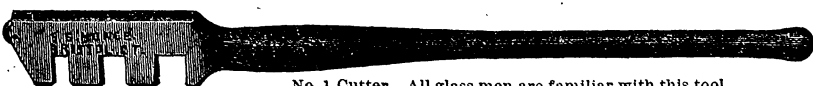
All Dealers Should Send for Our
OCTOBER 1st PRICE-LIST

—: AND:—

NEW DISCOUNTS.

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MONTPELIER, VT.

MONCE'S NOVELTY GLASS CUTTERS. — INTERCHANGEABLE LOCK STENCILS



No. 1 Cutter. All glass men are familiar with this tool.

S. G. MONCE, - - BRISTOL, CONN.

HARDWARE DEALERS

CAN RECOMMEND THE

**CHAMPION METAL WINDOW
SASH CHAINS**

to their customers as a reliable substitute for Sash Cords, very strong and lasting (some in daily use ten years), and gives thorough satisfaction wherever used. The patented attachments are very simple and can be applied to any window.

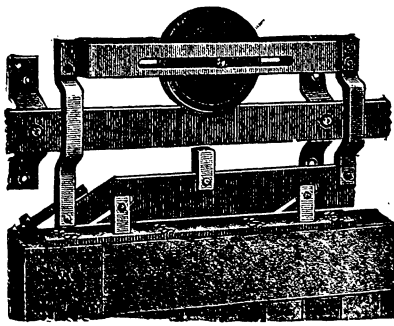
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"THOMAS MORTON,"

65 Elizabeth Street,

Write for Prices.

NEW YORK.



LANE'S PATENT NOISELESS STEEL PARLOR DOOR HANGER.

This Hanger is made of Steel.
The Wheel is also Steel, except the filling or tread.
The Track is of Steel—a single one only.
The Hanger is Anti-Friction.
More nearly Noiseless than any other.
Ease of adjustment.

Can be erected with half the labor others require.
Track will not swell, shrink or warp out of true.
No cutting of doors.
No matching of hardware.
Simplicity in all its parts.
Durability.

ALSO LANE BARN DOOR HANGER AND TRACK. SEND FOR CIRCULARS.

Manufactured by

LANE BROS., Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers St., New York.

He had in his possession 55 skeleton keys which the police claim would open any door.
—Chicago Tribune.

You are selling that kind of a lock every day and

your customers think you are selling the best the market affords.

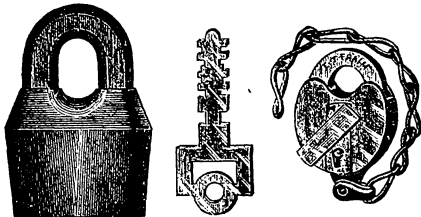
ARE YOU SELLING the best the market affords?

The Craig Locks are guaranteed Sneak Thief Proof.

Send for Catalogue.

KEYLESS LOCK CO., I. A. 197 So. Canal St., Chicago, Ill.

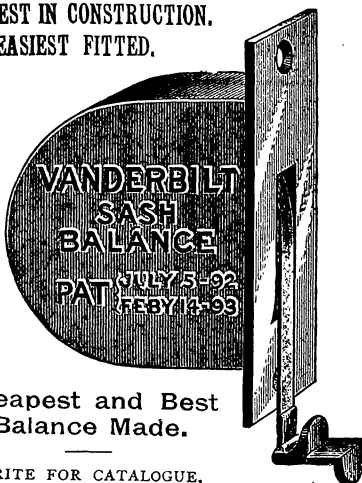
ESTABLISHED 1879.
KEYSTONE LOCK WORKS,
E. T. FRAIM, Lancaster, Pa., U. S. A.



Originators, designers, patentees and manufacturers of all the leading popular styles of **PADLOCKS**, Key-Locking Scandinavian with our patent Inter-Locking Tumblers; the only reliable lock of this style ever made. **SELF-LOCKING** Scandinavian of the highest type of perfection. Dust Proof Railroad, Freight Car and Switch Padlocks. Brass, Bronze, Steel and Malleable Iron Padlocks for all purposes and in all finishes. 131 different kinds. Write for our new 100-page catalogue.

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SIMPLEST IN CONSTRUCTION.
EASIEST FITTED.



**Cheapest and Best
Balance Made.**

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General Agents, Harmon & Dixon, 118 Chambers St.
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**COMMON MOUSE TRAPS
BEST FOR USE!**

Ripley Mfg. Co., Unionville, Con.



Porcelain-Lined Lemon Squeezers, Steak Hammers, Boot Jacks, Magnetic Tack Hammers, Mallets, Bung-Starts, Hand Screws, Beacon Hill Pat. Mouse Traps, Sunny-Side 2 lb. Lap Board.

PATENT PERFECTION PADLOCK



Eight Tumblers. Key Turning Both Ways.

Sizes; $\frac{1}{4}$ inch to $2\frac{1}{2}$ inches; of cast bronze. Durable for quality and price. No steel or iron used, cannot be picked. Also, $\frac{1}{4}$ and $\frac{1}{2}$ inch Padlocks, of a common pin, in brass and nickel; for cats and small dogs. The best Railroad Switch and Car Lock in the world. Adopted by the United States Treasury for bonded warehouses.

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Send for Price Lists and Circulars.



SALES OF THE

"Champion" 6-Lever Padlock

Never before Equalled what they attained in 1892.

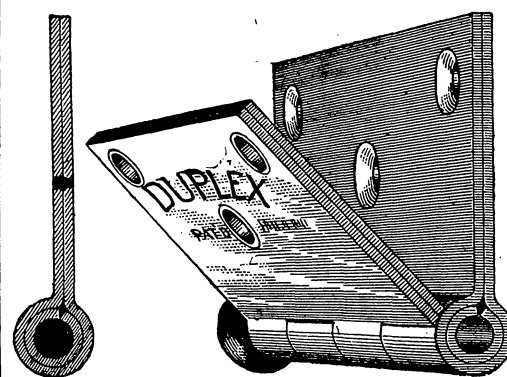
PRICE TALKS. QUALITY TALKS.

Sold by best Jobbers everywhere.

Every Dealer should have on File our Catalogue No. 11.

MILLER LOCK CO..

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"DUPLIX"

WROUGHT BRONZE

LOOSE PIN

BUTTS.

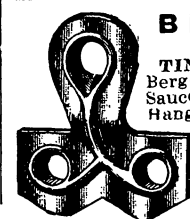
Best of the Kind.

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READING HARDWARE CO.,

READING, PA.

New York. Philadelphia. Chicago.



BERGER BROS.

Manufacturers of

TINNERS' HARDWARE.

Berger's Celebrated Fall Bars, Sauce Pan Handles, Eave Trough Hangers, Pipe Fasteners, Hooks, Straps and Barrel Trucks, &c., &c. Send for Prices and Catalogue.

237 ARCH ST.,

Philadelphia, Pa

THE QUEEN ANNE SCREEN CO.,

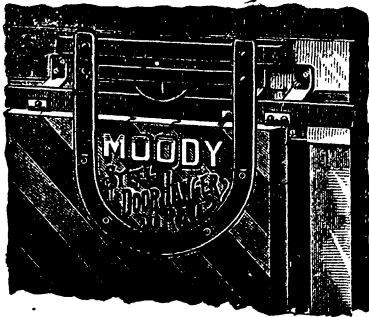
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MANUFACTURERS OF

Improved Adjustable Window Screens.
THE QUEEN ANNE. With box panels; the only screen made and finished alike on both sides.
THE EUREKA. The best cheap extension screen on the market.

SCREEN DOORS. Finished all ready to hang Sticks, Corners, Improved Frames, &c. Write for circular and Price-list.

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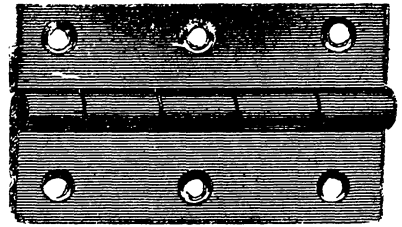
Showing one-half set of hangers attached to door.

STEEL RAIL.



The Only Bracing Bracket Made.

HANGERS.	PRICE-LIST.	Per Doz. prs.
No. 5, to run 6 feet, 3 1/4 in. wheel,	-	\$10.00
No. 6, to run 10 feet, 4 1/4 in. wheel,	-	15.00
No. 7, to run 15 feet, 5 1/4 in. wheel,	-	22.00
RAIL, per foot.....		6 1/2 cents



Cast Brass Butt Hinges

IN STOCK AND FOR SALE BY

W. & J. TIEBOUT,

Nos. 16 & 18 Chambers Street, New York,

MANUFACTURERS OF

**BRASS, GALVANIZED & SHIP CHANDLERY
HARDWARE.**

All Wrought Steel Center Neck Yoke.



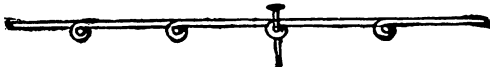
The Strongest, Lightest, Cheapest Yoke on
the Market.

Send for Price-List and Discount.

S. C. JOHNSON, - - Racine, Wis.

Lightning Band for Cases and Crates.

(COVERED BY U. S. LETTERS PATENT.)



Mounted on reels and always ready for use and convenient to handle. Easily and quickly binds shipping cases and crates in a neat, strong and substantial manner.

PRICES:

No. 1, per reel of 2000 ft., \$4.50 net.

No. 2, per reel of 2000 ft., \$4.75 net.

Pliers for cutting wire, 50 cents extra.

No. 1 for cases under 300 or 400 pounds, and No. 2 for all heavier cases.

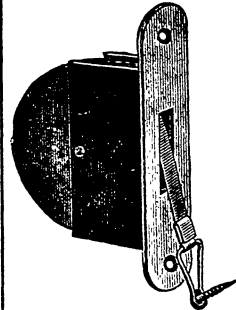
Buffalo Specialty Mfg. Co.
Sole Manufacturers,
Buffalo N. Y. U. S. A.

A Well Balanced Sash

IS LIKE

A Well Balanced Business Man,

gives satisfaction to those who are brought in contact with them. Don't be inveigled into buying anything called Sash Balances that have no record. Made from light cast iron. Ask your Hardware dealer for Pullman Steel Frame Sash Balance. Warranted 15 years. Only Steel Frame Sash Balance in the world.

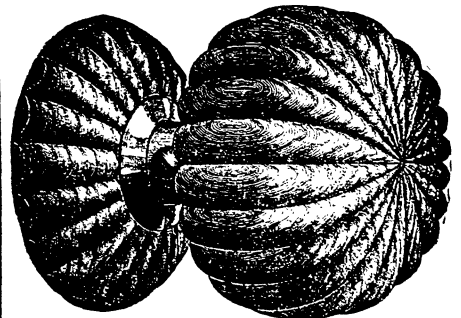


SIMPLE, CHEAP
AND DURABLE.

PULLMAN SASH BALANCE CO., Rochester, N. Y.

New York Office, 142 Chambers St.

Chicago Office, 235 Lake St.



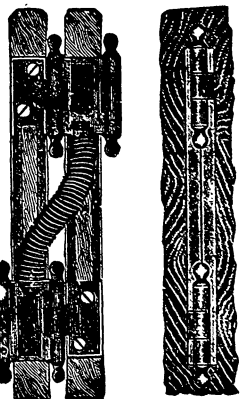
WOOD DOOR KNOBS,
DOOR SPRINGS AND CHECKS
AND CHECKING SPRING HINGES.

NEW GOODS. NEW PRICES.

Send for New Price-List.

J. BARDLEY, 149 & 151 Baxter St. New York.

Chicago Spring Butts

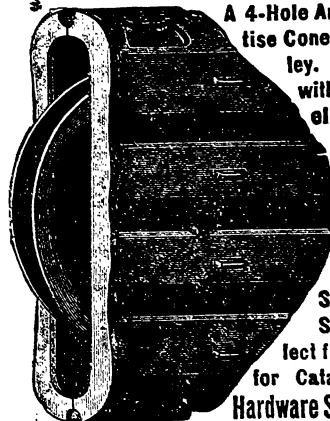


MANUFACTURED BY
Chicago Spring Butt Co.,
Chicago, Ill.

DOORS.	1	21	31	41	51
	Jap'd Pair.	Nickel Plated Pair.	Bronze Plated Pair.	Real Bronze Pair.	Polished Brass Pair.
1/2 to 1 in.	\$1.20	\$3.00	\$3.00	\$7.25	\$7.25
1 1/2 to 1 3/4 in.	1.50	3.75	3.75	8.00	8.00
1 3/4 to 2 in.	2.50	5.50	5.50	10.75	10.75
2 to 2 1/4 in.	4.00	7.50	7.50	18.00	18.00
2 1/4 to 2 3/4 in.	7.00	10.00	10.00	27.00	27.00
2 3/4 to 3 in.	10.00	14.00	14.00	36.00	36.00

Write for Catalogue
and Prices.

IDEAL SASH PULLEY.



A 4-Hole Auger Mortise Cone Axle Pulley. Applied without chisel or screws.

Each Pulley its own marking gauge. A variety of Styles and Sizes to Select from. Ask for Catalogue of Hardware Specialties

STOVER MFG. CO.
145 River St., Freeport, Ill.

SASH WEIGHTS

E. E. BROWN & CO.,

McKean and Meadow Sts.,

PHILADELPHIA PA.



SEND 50 CTS. FOR ONE BY MAIL.

EMPIRE PORTABLE FORGE CO.,
LANSINGBURGH, N. Y.

N. Y. Office, 103 Chambers St., W. H. QUINN, Manager

**FROST'S ANTI-RATTLER**

Pat. Jan. 20, 1880.

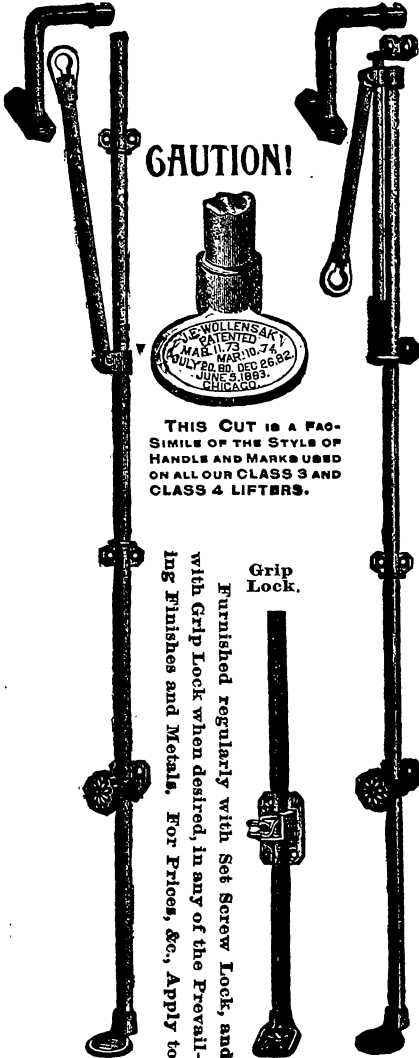
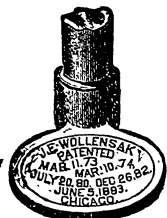
Cut One-half Size.

Sample pair sent to any hardware or saddlery firm by addressing

The Frost Thill Spring Co.,
Boston, Mass.

THE WILCOX & HOWE COMPANY,
BIRMINGHAM, CONN.,
MANUFACTURERS OF
A Full Line of Carriage Hardware
ALSO SPECIAL FORGINGS.

Estimates cheerfully given. Send for Catalogue

Transom...Lifters*OLD RELIABLE***J. F. WOLLENSAK'S PATENT.****CLASS 3.****CLASS 4.****CAUTION!**

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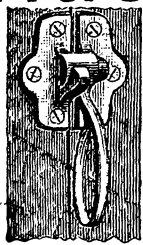
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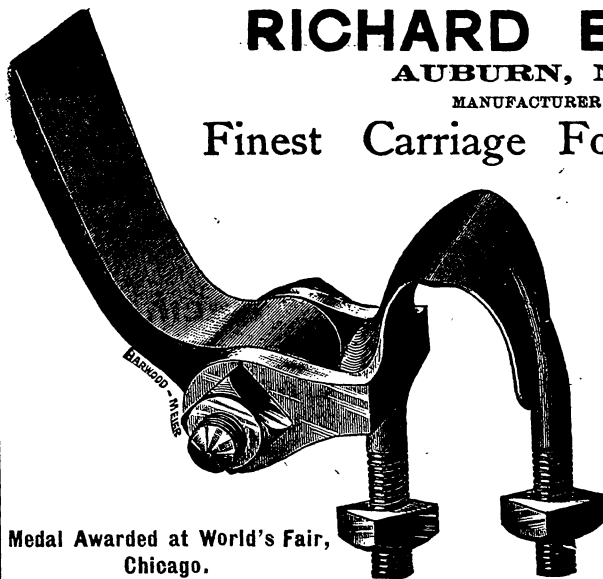
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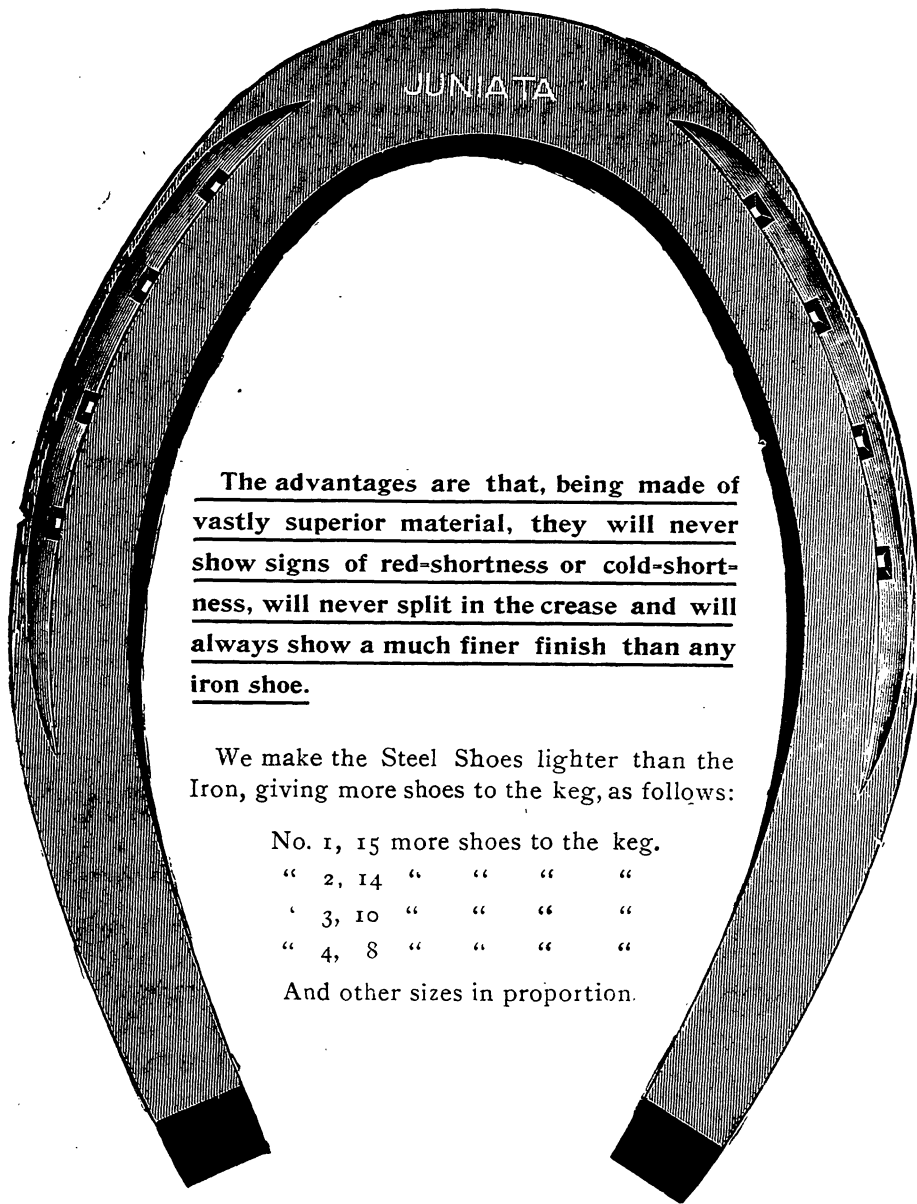
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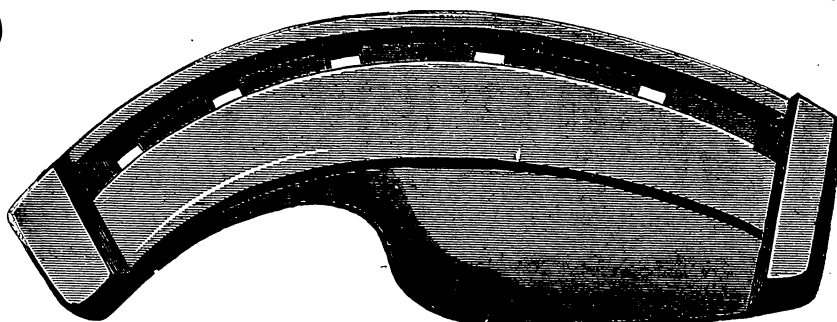
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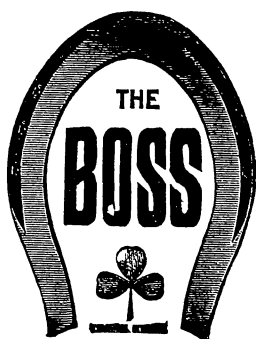
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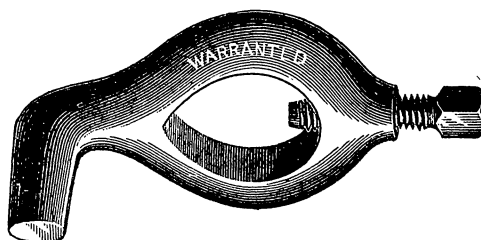
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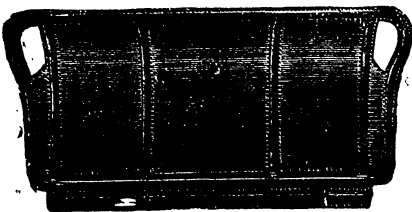
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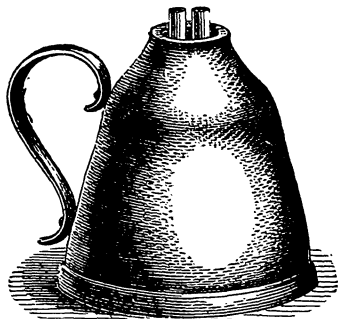
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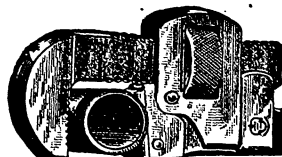
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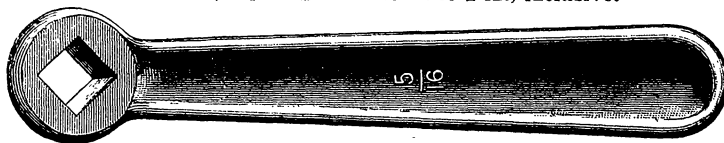
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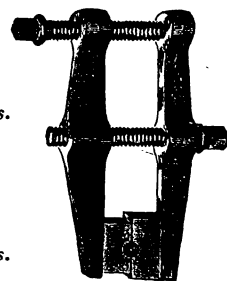
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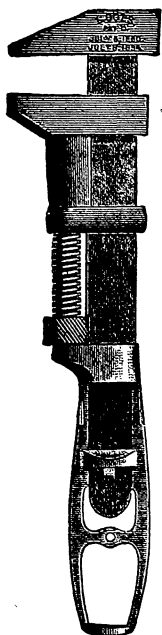
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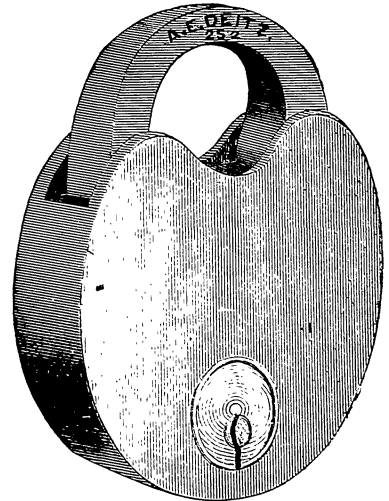
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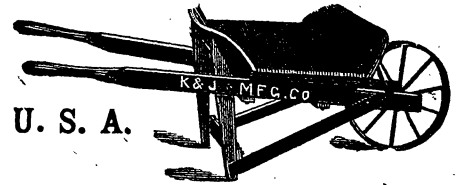
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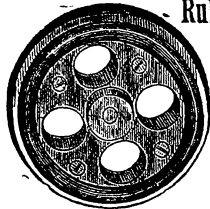
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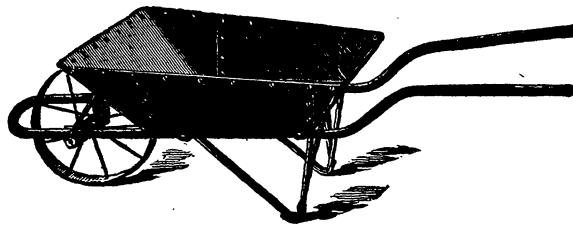
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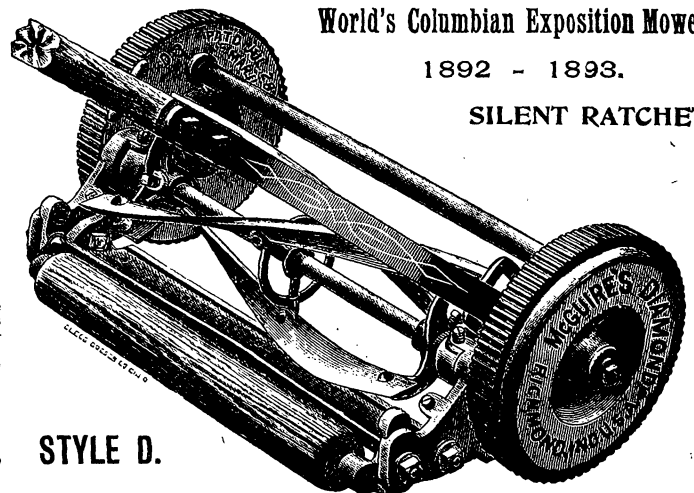
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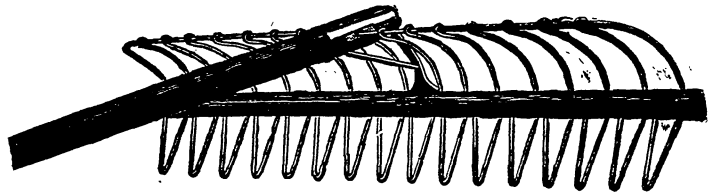
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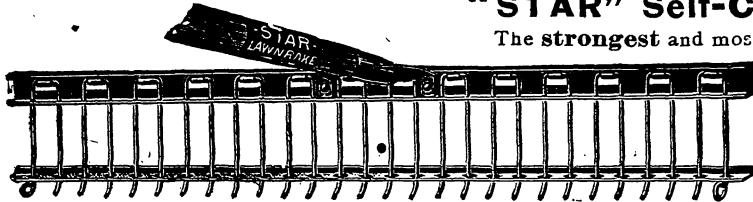
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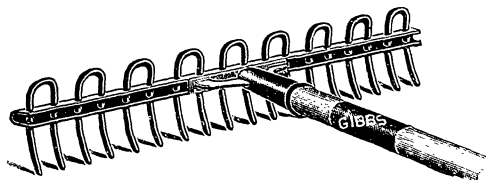
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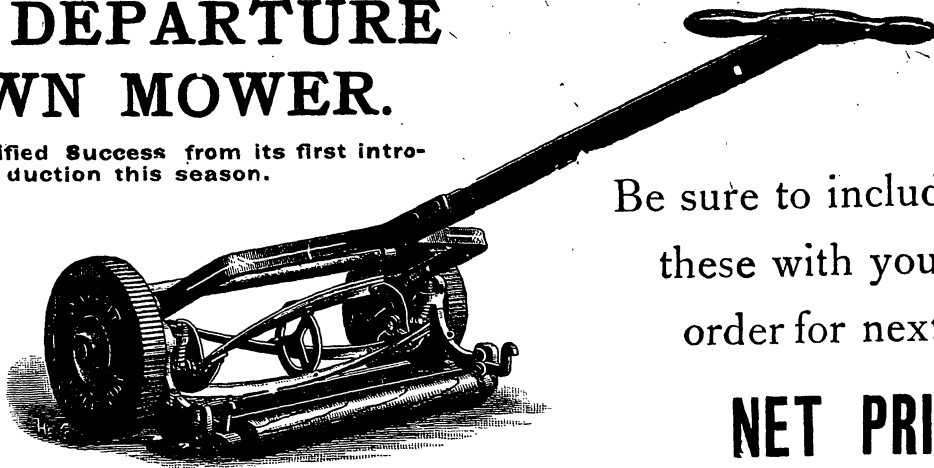
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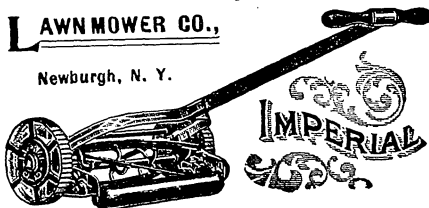
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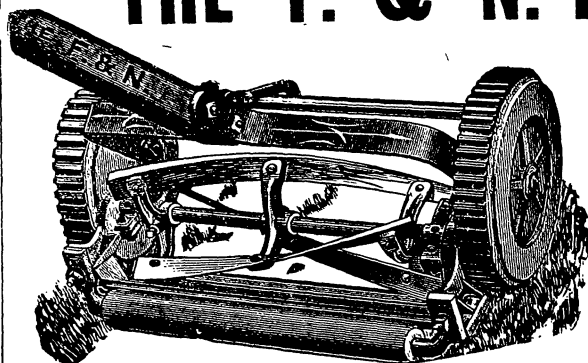
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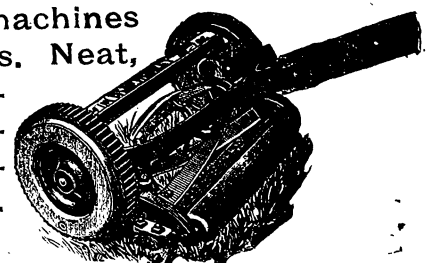
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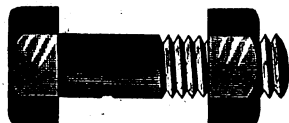
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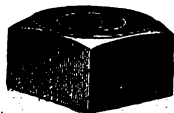
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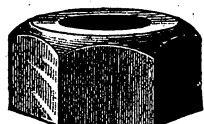
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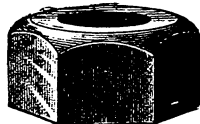
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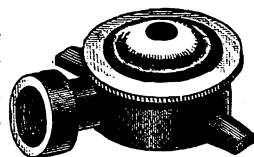
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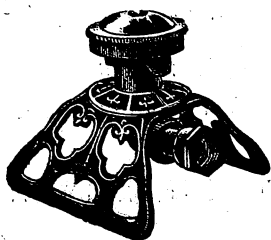
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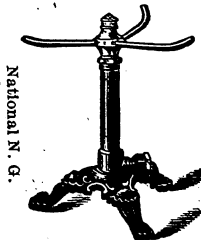


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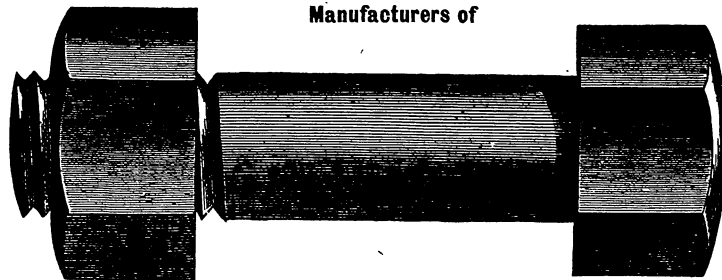
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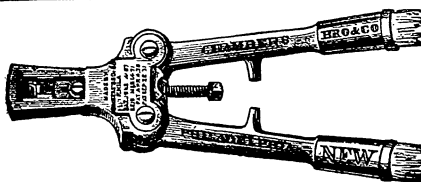
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Otto Gas Engine Works, Phila., Pa.
Bollason Gas Engine, Havemayer Bldg., N. Y.
- Engines, Steam. Makers of.**
Bass Foundry & Machine Works, Ft. Wayne, Ind.
Buckeye Engine Co., Salem, O.
Erie Engine Works, Erie, Pa.
Harrisburg Fdy. & Machine Works, Harrisburg, Pa.
Norwalk Iron Works Co., So. Norwalk, Conn.
Penna. Diamond Drill & Mfg. Co., Birdsboro, Pa.
Phila. Engineering Works, Phila., Pa.
Phoenix Iron Wks. Co., Meadville, Pa.
Shipman Engine Co., Boston, Mass.
Southwark Foundry and Machine Co., Phila., Pa.
Ted, William & Co., Youngstown, O.
Wetherill, Robt. & Co., Chester, Pa.
- Exhaust Tumblers.**
Sweater, W. A., Brooklyn, Mass.
- Expansion Belts.**
Boone, W. C. Mfg. Co., Boonton, N. J.
Church, Isaac, Toledo, O.
- Faucets, Self-Measuring.**
Lane Bros., Poughkeepsie, N. Y.
- Faucets, Wooden. Makers of.**
Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
John Sommer's Son, Newark, N. J.
- Feed-Water Heaters.**
Davis, I. B. & Son, Hartford, Conn.
Goubert Mfg. Co., 32 Cortlandt St., N. Y.
Harrison Safety Boiler Wks., Phila., Pa.
National Pipe Bending Co., New Haven, Conn.
Webster, Warren & Co., Camden, N. J.
Whitlock Coil Pipe Co., Elmwood, Conn.
- Fencing, Iron and Wire.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Clinton Wire Cloth Co., Clinton, Mass.
Gilbert & Bennett Mfg. Co., 42 Cliff St., Hartman Mfg. Co., Ellwood City, Pa.
Kilmer Mfg. Co., Newburgh, N. Y.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
Ballance Wire & Iron Wks., Milwaukee
- Files, Importers of.**
Moss, F. W., 80 John, N. Y.
- Files and Rasps, Manufacturers of.**
Arcade File Works, Anderson, Ind.
Banker & White, Troy, N. Y.
- Barnett, G. & H.,** 41 & 43 Richmond Phila.
McClaffrey File Co., Philadelphia.
Nicholson File Co., Providence R. I.
- Fire Brick. Makers of.**
Borgner, Cyrus, Philadelphia, Pa.
Gardner, Jas. & Son, Cumberland, Md.
Kreischer B. & Sons, Foot E. Houston, St. McLeod & Henry Co., Troy, N. Y.
Maurer, H. & Son, 420 E. 23d, N. Y.
Ostrander Fire Brick Co., Troy, N. Y.
Valentine, M. D. & Bro., Woodbridge.
- Fire Sets.**
Troy Nickel Works, Troy, N. Y.
- Fishing Tackle.**
Dame, Stoddard & Kendall, Boston, Mass.
- Flint and Emery Paper.**
Baeder, Adamson & Co., Phila., Pa.
- Flour Sifters.**
Sills, W. H., 83 Lake St., Chicago, Ill.
- Flue Cleaners.**
Mackey, Jas. T., St. Louis, Mo.
- Fodder Cutters.**
Silver Mfg. Co., Salem, O.
- Foreign Periodicals.**
Stechert, G. E., 810 Broadway, N. Y.
- Forges, Portable, &c.**
Buffalo Bellows Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Empire Portable Forge Co., Lansingburg, N. Y.
Foss Mfg. Co., Springfield, Ohio.
Sturtevant, B. K. Co., Boston, Mass.
- Forgings, Iron and Steel.**
Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Steel-Cambria Iron Co., Johnstown, Pa.
Scranton Forging Co., Scranton, Pa.
- Foundry Facings.**
Paxson, J. W. & Co., Phila.
S. Obermayer Co., Cincinnati, O.
Smith, J. D. Fdy. Supply Co., Cinn., O.
- Foundry Riddles.**
Estate, W. S., 65 Fulton, N. Y.
- Foundry Supplies.**
Colliau, Victor, Detroit, Mich.
Diamond Clamp & Flask Co., Richmond, Ind.
S. Obermayer Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia.
Smith, J. D. Fdy. Supply Co., Cinn., O.
- Friction Clutches.**
Keystone Clutch & Mch. Wks., Phila., Pa.
Moore & White Co., Philadelphia, Pa.
- Friction Cone.**
Evans Friction Cone Co., Boston, Mass.
- Fruit Presses.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Furnaces, Foundry.**
Byram & Co., Detroit, Mich.
- Gas Producers.**
Wood, R. D. & Co., Philadelphia, Pa.
- Gas & Steam Fitters' Supplies.**
Pancoast, Henry B. & Co., Phila., Pa.
- Gauge, Rolling Mill.**
Haines Gauge Co., Philadelphia, Pa.
- Gear Cutters.**
D. E. Whiton Mach. Co., New London, Conn.
- Gears.**
Boston Gear Works, Boston, Mass.
Poole, Robt. & Son Co., Baltimore, Md.
Shriver, T. & C., 333 E. 56th St., N. Y.
- Glass Boards.**
Canton Saw Co., Canton, O.
- Glass Cutters.**
Monce, S. G., Bristol, Conn.
- Glass Tubes.**
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
- Gline.**
Baeder, Adamson & Co., Phila., Pa.
Russia Cement Co., Gloucester, Mass.
- Grass Catchers.**
Supplee Hardware Co., Phila., Pa.
- Grass Hooks.**
Bruce & Marks Mfg. Co., Gas City, Ind.
- Grinding Mills.**
Foss Mfg. Co., Springfield, O.
- Grinding and Polishing Machines.**
Norton Emery Wheel Co., Worcester, Mass.
Washburn Shops, Worcester, Mass.
- Grindstone Dressing Machinery.**
Blake & Johnson, Waterbury, Conn.
- Grindstones.**
Cleveland Stone Co., Cleveland, O.
- Gunpowder, Makers of.**
Lafin & Rand Powder Co., 29 Murray St., N. Y.
- Hand Carts.**
Lansing Wheelbarrow Co., Lansing, Mich.
- Handles.**
New York Mallet and Handle Wks., 456 E. Houston St., N. Y.
- Hangers, Door.**
Chicago Spring Butt Co., Chicago, Ill.
Lane Bros., Poughkeepsie, N. Y.
Victor Mfg. Co., Newburyport, Mass.
- Hardware Comm'n Merchants.**
Doscher, Martin, 88 Chambers, N. Y.
Field, Alfred & Co., 93 Chambers St., N. Y.
Graham, John H. & Co., 111 Chambers St., New York.
Jacobus, W. H., 90 Chambers, N. Y.
- Hardware Manufacturers.**
Hotchkiss, E. S., Bridgeport, Conn.
Stearns, E. C. & Co., Syracuse, N. Y.
Union Mfg. Co., 108 Chambers, N. Y.
Yale & Towne Mfg. Co., Stamford, Conn.
- Hardware Mfrs. Agents.**
Bingham, W. Co., Cleveland, O.
Graham, John H. & Co., 113 Chambers St., New York.
McCoy, Jos. F. Co., 26 Warren St., N. Y.
Sickles Sweet & Lyon, 35 Barclay, N. Y.
Underhill, Clinch & Co., 94 Chambers St., N. Y.
- Hardware Specialties.**
Aome Shear Co., Bridgeport, Conn.
Belden Machine Co., New Haven, Conn.
Empire Portable Forge Co., Lansingburg, N. Y.
Enterprise Mfg. Co., Philadelphia, Pa.
Erie & Henger Mfg. Co., St. Louis, Mo.
Haines & Zimmerman, Phila., Pa.
Hart, H. C. Mfg. Co., Detroit, Mich.
Johnson, S. C., Racine, Wis.
Knapp & Cowles Mfg. Co., Bridgeport, Conn.
North Bros. Mfg. Co., Philadelphia, Pa.
Peabody & Parks, Troy, N. Y.
Weiland, Chas., 139 Chambers St., N. Y.
Wilson, J. Fred, Worcester, Mass.
Underhill, Clinch & Co., 94 Chambers Street, N. Y.
- Hardware, Yacht and Ship.**
Ferdinand, L. W. & Co., Boston, Mass.
- Harness Snaps.**
Covert Mfg. Co., West Troy, N. Y.
Coverts' Saddlery Wks., Farmer, N. Y.
Fitch, W. & E. T., New Haven, Conn.
- Hay Knives.**
Bruce & Marks Mfg. Co., Gas City, Ind.
Holt, Hiram Co., E. Wilton, Me.
- Hoisting Machines.**
Box, Alfred & Co., 314 Green, Phila.
Brown Hoisting & Conveying Mch. Co., Cleveland, Ohio.
Fulton Iron & Engine Wks., Detroit, Mich.
Harrington, E., Son & Co., Phila.
Lane Bros., Poughkeepsie, N. Y.
Lidgerwood Mfg. Co., 98 Liberty, N. Y.
Morris & Beekley, Philadelphia.
Moore Mfg. & Fdy. Co., Milwaukee, Wis.
Morse, Williams & Co., Phila.
Sellers, Wm. & Co., Phila. and N. Y.
Speldel, J. G., Reading, Pa.
Yale & Towne Mfg. Co., Stamford, Ct.
- Hollow Ware.**
Bronson Supply Co., Cleveland, Ohio.
Cleveland Stamping & Tool Co., Cleveland, O.
Stuart & Peterson Co., Phila., Pa.
- Hollow Ware, Aluminum.**
Illinois Pure Aluminum Co., Lemont, Ill.
- Horse and Barbers' Clippers.**
Hotchkiss, E. S., Bridgeport, Conn.
- Horse Nails, Makers of.**
National Horse Nail Co., Vergennes, Vt.
- Horse and Mule Shoes. Makers of.**
Stryden Horse Shoe Co., Catsaqua, Pa.
Burden Iron Co., Troy, N. Y.
Crescent Horse Shoe & Iron Co., Max Meadows, Va.
Diamond State Iron Co., Wilmington, Del.
Old Dominion Iron & Nail Works Co., Richmond, Va.
Phoenix Horse Shoe Co., Poughkeepsie, N. Y.
Rhode Island Perkins Horse Shoe Co., Providence.
Shoenberger & Co., Pittsburgh, Pa.
Standard Horse Shoe Co., Boston, Mass.
- Hose.**
Cleveland Rubber Works, Cleveland, O.
N. Y. Belting & Packing Co., Ltd., 16 Park Row, N. Y.
- Hydrants, &c.**
McLean, John, 296 & 298 Monroe, N. Y.
- Hydraulic Jacks.**
Dudgeon, Richard, 24 Columbia, N. Y.
Watson & Stillman, 204 E. 43d, N. Y.
- Ice-Cream Freezers.**
North Bros. Mfg. Co., Phila., Pa.
Packer, C. W., Philadelphia, Pa.
White Mountain Freezer Co., Nashua, N. H.
- Ice Shavers.**
Enterprise Mfg. Co., Philadelphia, Pa.
- Injectors.**
Eynon-Evans Mfg. Co., Philadelphia, Pa.
Jenkins Bros., New York
- Insurance, Boiler.**
Hartford Steam Boiler Inspection & Insurance Co., Hartford, Conn.
- Iron and Steel, Swedish.**
Lundberg, Gustaf, Boston, Mass.
Milne, A. & Co., 1 Broadway, N. Y.
- Iron Commission Brokers.**
Corning, Edw. & Co., 29 B'way, N. Y.
Cotton, Bradley & Co., Philadelphia.
Etting, Edw. J., Philadelphia.
Hogan, John, & Co., Philadelphia, Pa.
Hoffman, J. W. & Co., Philadelphia.
Levis, Henry & Co., Philadelphia.
Keeley, Jerome & Co., Philadelphia.
Lee, J. Tammal & Co., Philadelphia.
Mohr, J. J., 430 Walnut, Philadelphia.
Filling & Crane, Philadelphia, Pa.
Sibell, Geo. H. & Co., Chicago, Ill.
Wister, L. & R. Co., Phila., Pa.
- Iron Ore.**
Naylor & Co., 45 Wall, N. Y.
Fulman, J. Wesley, Phila., Pa.
Samuel, Frank, Philadelphia, Pa.
- Iron, Merchants.**
Barnes, O. K. & Co., Philadelphia, Pa.
Borden & Lovell, 70 West, N. Y.
Bussenius & Cunliffe, Philadelphia.
Corning Edw. & Co., 29 B'way, N. Y.
Cox, Justice Jr., Philadelphia.
Corson, Bradley & Co., Philadelphia.
Hoffman, J. W. & Co., Philadelphia.
Leonard, J., 446 West St., N. Y.
Navior & Co., 45 Wall St., N. Y.
Nicolls, Wheeler & Co., Philadelphia.
Ogden & Wallace, 85 Elm St., N. Y.
Pierson & Co., 29 Broadway, N. Y.
Thomas, W. H. & Co., Phila., Pa.
Wallace, Wm. H. & Co., Albany & Washington streets, N. Y.
Whitney, A. R. & Co., 17 B'way, N. Y.
Wilson, S. H. & Co., Philadelphia.
- Iron, Importers.**
Abbott Wheelock & Co., N. Y. and Boston
Lundberg, Gustaf, Boston, Mass.
- Iron, Sheet. Manufacturers of.**
Cambridge Iron & Steel Co., Cambridge Ohio
W. Dewees Wood Co., Lim., McKeesport, Pa.
- Ironwork, Ornamental.**
Barnum, E. T., Detroit, Mich.
Champion Iron Co., Kenton, O.
Ludlow-Saylor Wire Co., St. Louis, Mo.
Mast, Foss & Co., Springfield, O.
The Van Dorn Iron Works Co., Cleveland, O.
- Keys.**
Wollensak, J. F., Chicago, Ill.
- Ladies.**
Detroit Fdy. Equipment Co., Detroit, Mich.
- Lamps.**
Standard Lighting Co., Cleveland, O.
- Lamp Stoves.**
Glazier Stove Co., Chelsea, Mich.
- Lanterns.**
Ohio Lantern Co., Tiffin, Ohio.
Steam Gauge & Lantern Co., Syracuse, N. Y.
- Lathes.**
Draper Machine Tool Co., Worcester, Mass.
Johnson, Israel H., Jr., & Co., Philadelphia, Pa.
Seneca Falls Mfg. Co., Seneca Falls, N. Y.
- Lathing, Wire.**
Clinton Wire Cloth Co., Clinton, Mass.
N. J. Wire Cloth Co., Trenton, N. J.
Wright & Colton Wire Cloth Co., Worcester, Mass.
- Lawn Mowers.**
Chadborn & Coldwell Mfg. Co., Newburgh, N. Y.
Coldwell Lawn Mower Co., Newburgh, N. Y.
Dille & McGuire Mfg. Co., Richmond, Ind.
F. & N. Mfg. Co., Richmond, Ind.
Henley, M. C., Richmond, Ind.
Lape, W. E., Syracuse, N. Y.
Mast, Foss & Co., Springfield, O.
Stearns, E. C. & Co., Syracuse, N. Y.
Supplee Edw. Co., Phila., Pa.
- Lawn Rakes.**
Gibbs Mfg. Co., Canton, Ohio.
Konler, F. E. & Co., Canton, O.
Schaeffer & Co., Dayton, Ohio.
Syracuse Specialty Mfg. Co., Syracuse, N. Y.
- Lawn Sprinklers.**
Ette & Henger Mfg. Co., St. Louis.
McGowan, John H. Co., Cincinnati, O.
- Lawn Sweepers.**
Lape, W. E., Syracuse, N. Y.
- Lemon Squeezers.**
Ripley Mfg. Co., Unionville, Conn.
- Letters and Figures, Metallic.**
White, A. A. & Co., Providence, R. I.
- Letters, Paper.**
Tablet & Ticket Co., Chicago, Ill.
- Levels.**
Davis & Cook, Watertown, N. Y.
Richardson, O. F. & Son, Athol, Mass.
- Locks & Knobs, Manufacturers of.**
Deltz, A. E., 97 Chambers, N. Y.
Keyless Lock Co., Chicago, Ill.
Reading Hdq. Co., Reading, Pa.
Smith & Egge Mfg. Co., Bridgeport, Conn.
Yale & Towne Mfg. Co., Stamford, Conn.

Machinery.

Am. Tool Works. Cleveland, Ohio.
 Barnes, W. F. & John, Rockford, Ill.
 Bement, Miles & Co., Philadelphia, Pa.
 Bigelow, C. E., 45 Day, N. Y.
 Signal & Keeler Mfg. Co., St. Louis.
 Birmingham Iron Foundry, Birmingham, Conn.
 Bliss, E. W. Co., Brooklyn, N. Y.
 Bogert, Jno. L., Flushing, N. Y.
 Briggs, Marvin, 12 Broadway, N. Y.
 Carlin's Sons, Thos., Allegheny, Pa.
 Cinn. Milling Mch. Co., Cincinnati, Ohio.
 Clapp, Geo. M., 47 Cortlandt, N. Y.
 Coulter & McKensie Mch. Co., Bridgeport, Conn.
 Crulshank, D. B., Providence, R. I.
 Detroit & Harvey Mch. Co., Baltimore, Md.
 Fitchburg Mch. Works, Fitchburg, Mass.
 Garvin Mch. Co., Laight & Canal Sts.
 Gould & Eberhardt, Newark, N. J.
 Hamilton Mch. Co., Hamilton, O.
 Harrington & King Perforating Co., Chicago, Ill.
 Henderson, A. L., Wilmington, Del.
 Hendey Machine Co., Torrington, Ct.
 Hill, Clarke & Co., Boston, Mass.
 Johnson, Israel H., Jr., & Co., Phila.
 Jones & Lamson Mch. Co., Springfield, Vt.
 Lodge & Shipley Mch. Tool Works, Cincinnati, Ohio.
 Lovegrove & Co., Philadelphia, Pa.
 McCabe, J. J., 68 Cortlandt, N. Y.
 Machinists Supply Co., Rochester, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Conn.
 Newark Mch. Tool Works, Newark, N. J.
 New Haven Mfg. Co., New Haven, Conn.
 New York Mach. Depot, N. Y.
 Niles Tool Wks., 188 Liberty St., N. Y.
 Pittsburgh Mfg. Co., Pittsburgh, Pa.
 Place, Geo., 120 Broadway, N. Y.
 Poole, Robt. & Son Co., Baltimore, Md.
 Powell Planer Co., Worcester, Mass.
 Pratt & Whitney Co., Hartford, Conn.
 Prentiss Tool & Supply Co., N. Y.
 Scranton Supply & Mchry. Co., Scranton, Pa.
 Sellers, Wm. & Co., Phila.
 Seyfert's Sons L. F., Philadelphia, Pa.
 Steptoe, J. & Co., Cincinnati, O.
 Stow Flexible Shaft Co., Ltd., Phila.
 Toomey, Frank, Philadelphia, Pa.
 Wetherill, Robert & Co., Chester, Pa.
 Wilson, W. A., Rochester, N. Y.

Machinery for Hardware Manufacture.

Adt, Jno. & Son, New Haven, Conn.

Machine Knives.

Loring Coes & Co., Worcester, Mass.
 Loyd, John, 558-562 Water St., N. Y.

Machine Tools.—See Machinery.**Machine Work.**

Papping, J., 58th St., & 11th Ave., N. Y. City.

Machinists' Scales.

Coffin & Leighton, Syracuse, N. Y.
 Starratt, L. S., Athol, Mass.
 Wallentine Tool Co., Hartford, Conn.

Machinists' Tools and Supplies.

King, J. M. & Co., Waterford, N. Y.
 Sellers, Wm. & Co., Inc., Phila.

Mallets.

N. Y. Mallet & Handle Works, N. Y.

Manufacturing Sites.

Chicago, Milwaukee & St. Paul R. R., Chicago, Ill.

Measuring Tapes.

Keuffel & Esser Co., 127 Fulton St., N. Y.
 Lufkin Rule Co., Saginaw, Mich.

Meat Cutters.

Enterprise Mfg. Co., Philadelphia, Pa.

Mechanical Instruction.

Correspondence School of Mechanics, Scranton, Pa.

Metals.

Fearing, Wm. S., 100 Chambers, N. Y.
 Hendricks Bros., 49 Cliff, N. Y.
 Naylor & Co., 45 Wall, N. Y.

Metal Brokers.

American Metal Co., N. Y.

Metalburgists.

Britton, J. Blodgett, Phila.

Milling Machines.

Cin. Milling Mch. Co., Cincinnati, Ohio.

Mining Knives.

Palmer Edw. Mfg. Co., Troy, N. Y.

Mine Lamps.

Darby, Edw. & Sons, Phila. Pa.
 Leonard, B. E., Scranton, Pa.

Mining Screens.

Harrington & King Perforating Co., Chicago, Ill.

Motors, Water and Electric.

O. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thos. H. & Co., Phila., Pa.

Motor Drivers.

Rice, C. F., Chicago, Ill.

Molding Sand.

Obernayer, S. Co., Cincinnati, O.

Motors, Water and Electric.

O. & C. Electric Co., 402 and 404 Greenwich St., N. Y.
 Dallett, Thos. H. & Co., Phila., Pa.

Mail Machinery.

Pittsburgh Mfg. Co., Pittsburgh, Pa.

Nails (Cut) and Spikes.

Borden & Lovell, 70 West, N. Y.
 Cumberland Nail & Iron Co., Phila.
 Oxford Iron Co., 81 Washington, Pottstown Iron Co., Pottstown, Pa.
 Riverside Iron Wks., Wheeling, W. Va.

Neck Yokes.

Johnson, S. C., Racine, Wis.

Nickel Platers' Supplies.

Colburn Electric Mfg. Co., Fitchburg.
 Eddy Electric Mfg. Co., Windsor, Conn.
 Zucker & Levers Chemical Company, 10 to 14 Grand St., N. Y.

Norway Shapes, Rollers of.

Rowland, William & Harvey, Frankford, Philadelphia

Novelty Manufacturers.

Franklin, H. H. Mfg., Syracuse, N. Y.

Nut Machines.

Dunham Nut Mch. Co., Unionville, Ct.

Nuts, Bolts, &c., Makers of.

American Bolt Co., Lowell, Mass.
 American Screw Co., Providence, R. I.
 Blake & Johnson, Waterbury, Conn.
 Haskell, Wm. H. Co., Pawtucket, R. I.
 Mt. Carmel Bolt Co., Mt. Carmel, Conn.
 Port Chester Bolt and Nut Co., Chester, N. Y.
 Russell, Burdall & Ward, Port Chester, N. Y.
 Sarnberg, J. R. & Son, Reading, Pa.
 Wilson, J. Fred, Worcester, Mass.
 Wm. H. Haskell Co., Pawtucket, R. I.

Oilers.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Oil Stones.

Pike Mfg. Co., Pike Station, N. H.

Oil Stoves.

Glazier Stove Co., Chelsea, Mich.

Ores.

Wister, Francis, Philadelphia, Pa.

Or Shoes.

Scranton Forging Co., Scranton, Pa.

Packing.

Morrison, Robt., St. Louis, Mo.
 N. Y. Beltine & Packing Co., Ltd., N. Y.

Padlocks.

Ames Sword Co., Chicopee, Mass.
 Evans & Rowson, Phila. & Washgton.
 Jenner, H. W. T., Washington, D. C.
 Stocking, E. B., Washington, D. C.

Paint.

Dixon, Jos. Crucible Co., Jersey City, N. J.
 Garry Iron & Steel Roofing Co., Cleveland, O.

Paint Burners.

Dangler Stove & Mfg. Co., Cleveland, O.

Paint Cans.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Patent Solicitors.

Evans & Rowson, Phila. & Washgton.
 Jenner, H. W. T., Washington, D. C.
 Stocking, E. B., Washington, D. C.

Perforated Metal.

Clinton Wire Cloth Co., Clinton, Mass.
 Harrington & King Perforating Co., Chicago, Ill.
 Hendrick Mfg. Co., Ltd., Carbondale, Pa.

Phosphor Bronze.

Phosphor Bronze Smelting Co., Limited, 612 Arch, Philadelphia.

Phosphor Tin.

Crescent Phosphorized Metal Co., Philadelphia, Pa.
 Crosby Steam Gage & Valve Co., Boston, Mass.
 Halk & Naumann, 516 Pearl, N. Y.

Picks and Mattocks.

Plumb, Fayette R., Philadelphia, Pa.

Pig Iron.

Houston, C. B. & Co., Philadelphia, Pa.
 Montour Iron & Steel Co., Danville, Pa.
 Naylor & Co., 45 Wall, N. Y.
 Filming & Crane, Philadelphia, Pa.
 Samuel, Frank, Philadelphia, Pa.

Pig Iron Storage.

Am. Pig Iron Storage Warrant Co., 44 Wall, N. Y.

Pile Drivers.

Vulcan Iron Wks., Chicago, Ill.

Pipe Bent.

National Pipe Bending Co., New Haven

Pipe Cutting and Threading Machines.

Signal & Keeler Mfg. Co., St. Louis, Mo.
 Merrill Mfg. Co., Toledo, O.
 Hancock Henry B. & Co., Philadelphia.
 Sander's Sons, D., Yonkers, N. Y.

Pipe Grips.

Prentiss Vise Co., 44 Barclay, N. Y.

Pipes, Fittings, &c., Makers of.

McNab & Hardin Mfg. Co., N. Y.

Pipe, Water and Gas, Makers of.

Cumberland Nail & Iron Co., Phila. Pa.
 Donaldson Iron Co., Emsa, Pa.
 Riverside Iron Works, Wheeling, W. Va.
 Wood, R. D. & Co., Philadelphia, Pa.

Plane Irons, Manufacturers of.

Buck Bros., Millbury, Mass.

Planes, Manufacturers of.

Stanley Rule & Level Co., N. Y.

Plate Bending Rolls.

Schneekloth, H. A., 530 W. 28th St., N. Y.

Plate, Iron and Steel, Mfrs of.

Extra-Standard Iron & Steel Co., Bridgeport, O.
 Lukens Iron & Steel Co., Coatesville, Pa.
 Mahoning Valley Iron Co., Youngstown, Ohio.
 McLean Co., Pittsburgh, Pa.
 McIlvain & Sons, Reading, Pa.
 Pottstown Iron Co., Pottstown, Pa.
 Pottsville Iron & Steel Co., Pottsville, Pa.

Singer, Mimick & Co., Pittsburgh, Pa.

The Mahoning Valley Iron Co., Youngstown, O.
 Wellman Iron & Steel Co., Thurlow, Pa.
 Wood Alan Co., Philadelphia.

Plating, Nickel, Brass and Silver.

Wilmut & Hobbs Mfg. Co., Bridgeport, Conn.

Pliers and Nippers.

Healy, C. J., 106 Chambers St., N. Y.

Pokers and Lifters.

Troy Nickel Works, Troy, N. Y.

Polishing Machines.

Watson & Stillman, 204 E. 43d, N. Y.

Polishing Wheel.

La Massena, C. E. & Co., Newark, N. J.

Post Hole Diggers.

Wister, L. & R. & Co., Philadelphia, Pa.

Poultry Nettings.

Barnum, E. T., Detroit, Mich.
 Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

R. J. Wire Cloth Co., Trenton, N. J.

"Silver Finish."
 Tyler Wire Wks. Co., W. S., Cleveland, O.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Powder.

Ladin & Rand Powder Co., 29 Murray St., New York
 New York Powder Co., 62 Liberty St., N. Y.

Power Hack Saws.

Millers Falls Co., 93 Reade St., N. Y.

Power Hammers.

Belden Mach. Co., New Haven, Conn.
 Diener & Eisenhardt, Philadelphia.
 Jenkins & Lingie, Bellefonte, Pa.

Presses, Dies, &c.

E. W. Bliss Co., Brooklyn, N. Y.
 Crosby, G. A. & Co., Chicago, Ill.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Siles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Mch. Co., Waterbury, Conn.

Presses, Power, Makers of.

Bliss, E. W. Co., Brooklyn, N. Y.
 Manville, E. J. Mch. Co., Waterbury, Ct.
 Merriman, A. H., Meriden.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Waterbury Farrel Foundry and Machine Co., Waterbury, Conn.

Pulleys.

Keystone Clutch Mch. Wks., Phila., Pa.
 Lake, J. H. & D. Co., Massillon, Ohio.

Pulverizing Mill.

Bradley Fertilizer Co., Boston, Mass.

Pumping Machinery.

Coulter & McKensie Mch. Co., Bridgeport, Conn.
 Dean Bros. Steam Pump Works, Indianapolis, Ind.
 Hooker-Corville Steam Pump Co., Chicago, Ill.
 McCowan, J. H. & Co., Cincinnati, O.
 Maslin, J. & Son, Jersey City, N. J.
 Norwalk Iron Wks. Co., So. Norwalk, Conn.
 Southwark Fdy. & Mch. Co., Phila., Pa.
 Valley Pump Wks., Easthampton, Mass.
 Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Pumps, Makers of.

Bellevue Pump Co., Bellevue, Iowa.
 Deming Co., Salem, O.
 Douglas, W. & B., Middletown, Conn.
 Mast, Foe & Co., Springfield, O.
 Myers, F. E. & Bro., Ashland, O.

Punches and Shears, Hand and Power.

E. W. Bliss Co., Brooklyn, N. Y.
 Cockburn Barrow & Mch. Co., Jersey City, N. J.
 Crosby, G. A. & Co., Chicago, Ill.
 Henderer, A. L., Wilmington, Del.
 Schneekloth, H. A., 530 W. 28th St., N. Y.
 Stark Mch. & Tool Co., Buffalo, N. Y.
 Siles & Parker Press Co., Brooklyn, N. Y.
 Waterbury Farrel Foundry and Mch. Co., Waterbury, Conn.
 Watson & Stillman, 204 E. 43d, N. Y.

Rails, Old and New.

Perry, W. H. & Co., Providence, R. I.

Rat and Mouse Traps.

Burditt & Williams, Boston, Mass.
 Estey, W. S., 65 Fulton, N. Y.
 Ripley Mfg. Co., Unionville, Conn.

Razors.

Curley, J. & Bro., 6 Warren St., N. Y.
 Electric Shaver Co., 113 Chambers, N. Y.
 J. R. Torrey Razor Co., Worcester, Mass.

Reels.

Hendry, A. B. Co., New Haven, Conn.

Refrigerator Door Fasteners.

Conroy, P. J. & Co., Philadelphia.

Rivets.

Blake & Johnson, Waterbury, Conn.
 Boyce Rivet Co., Muncie, Ind.
 Burden Iron Co., Tr. Y., N. Y.
 Cobb & Drew, Plymouth, Mass.
 Henderson, Jas. S., 165 Greenwich, N. Y.
 Plymouth Mills, Plymouth, Mass.
 Sternbergh, J. H. & Son, Reading, Pa.
 Townsend, W. P. & Co., New Brighton, Pa.

Riveting Machines.

Adt, Jno. & Sons, New Haven, Conn.
 Band Drill Co., 28 Park Place, N. Y.

Rolling Mill Machinery.

Birmingham Iron Fdry, Birmingham, Conn.
 Booth, The Lloyd, Co., Youngstown, O.
 Leeburg Foundry & Mch. Co., Pittsburgh, Pa.
 Mahoning Fdry & Mch. Co., Danville, Pa.
 Morgan Construction Co., Worcester, Mass.
 Robinson-Rea Mfg. Co., Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.
 Trethewey Mfg. Co., Pittsburgh, Pa.
 Waterbury Farrel Foundry & Mch. Co., Waterbury, Conn.

Roll Lathes.

Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

Rolls, Chilled, Sand and Steel.

Booth, The Lloyd, Co., Youngstown, O.
 Garrison, A. Fdry Co., Pittsburgh, Pa.
 Seaman, Sleeth & Black, Pittsburgh.
 Totten & Hogg Iron and Steel Fdry Co., Pittsburgh, Pa.

Roofing.

Berlin Iron Bridge Co., E. Berlin, Conn.
 Boston Bridge Works, Boston, Mass.
 Cambridge Roofing Co., Cambridge, O.
 Cincinnati Corrugating Co., Piqua, O.
 Johns, H. W. Mfg. Co., 87 Malden Lane

Rope and Web Goods.

Covert Mfg. Co., West Troy, N. Y.
 Covert's Saddlery Wks., Farmer, N. Y.

Rope Wheels.

Cresson, Geo. V. Co., Philadelphia, Pa.

Rubber Goods.

Canfield, H. O., Bridgeport, Conn.

Rules, Manufacturers of.

Keuffel & Esser Co., 127 Fulton St., N. Y.
 Lufkin Rule Co., Saginaw, Mich.
 Standard Tool Co., Athol, Mass.
 Stanley Rule & Level Co., 29 Chambers,

Sand Paper.

Baeder, Adamson & Co., Phila., Pa.

Sash Balances.

Pulman Sash Balance Co., Rochester, N. Y.
 Vanderbilt Sash Balance Co., Canandaigua, N. Y.

Sash Cords and Chains.

Morton, Thos., 65 Elizabeth, N. Y.
 Ossawan Mills Co., Norwich, Conn.
 Samson Cordage Works, Boston, Mass.
 Smith & Egge, Mfg. Co., Bridgeport, Conn.
 Cincinnati Corrugating Co., Piqua, O.

Sash Locks.

Ives, H. B. & Co., New Haven, Conn.

Sash Pulleys.

Empire Portable Forge Co., Lansingburgh, N. Y.
 Palmer Hardware Mfg. Co., Troy, N. Y.

Sash Weights.

Brown, E. & Co., Philadelphia, Pa.

Saws, Makers of.

Diston, Henry & Sons, Phila., Pa.
 Hiles, C. A. & Co., 338-338 Carroll Ave, Chicago, Ill.
 National Saw Co., 98 Reade St., N. Y.
 Simonds Mfg. Co., Fitchburg, Mass.

Saw Sets.

Taintor Mfg. Co., 84-86 Chambers, N.

Scales, Manufacturers of.

Buffalo Scale Co., Buffalo, N. Y.
 Chatillon, John & Sons, 85-89 Cliff, N. Y.

Scrapers, Road.

Allentown Rolling Mill. Allentown, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Passaic Rolling Mill Co., Paterson, N.J.
Pottsville Iron & Steel Co., Pottsville, Pa.
Roberts, A. & P. & Co., Phila., Pa.
The Phoenix Iron Co., Phila., Pa.
Tudor Iron Works, St. Louis, Mo.

Shears and Scissors.
Acme Shear Co., Bridgeport, Conn.
Heinrichs, R. Sons Co., Newark, N. J.

Sheet Iron and Steel, Manufacturers of.
Atlas-Standard Iron and Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, Ohio.
Chess Bros., Pittsburgh, Pa.
Mahoning Valley Iron Co., Livingston, Ohio.
Moorehead-McCleane Co., Pittsburgh, Pa.
Pierson & Co., 29 Broadway, N. Y.
Reilly, John W., Fort Hunter P. O., Pa.
Singer, Nimick & Co., Ltd., Pittsburgh, Pa.
The Mahoning Valley Iron Co., Youngstown, O.
Alan Wood Co., Philadelphia, Pa.
W. Dewees Wood Co., McKeesport, Pa.

Sheet Metal Work.
Clark & Cowles, Plainville, Conn.

Sheet Zinc.
Mathlessen & Hegeler Zinc Co., La Salle, Ill.

Shelf Brackets.
Koch, A. B. & Co., Peoria, Ill.

Sinks.
Douglas, W. & B., Middletown, Conn.

Skates, Ice.
Dame, Stoddard & Kendall, Boston, Mass.
Sickels, Sweet & Lyon, 35 Barclay St., N. Y.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Skates, Roller.
Henley, M. C., Richmond, Ind.
Winslow, Sam'l, Skate Mfg. Co., Worcester, Mass.

Smelting Works.
Reeves, Paul S., 780 S. Broad, Phila.

Soldering Coppers.
Clendenin Bros., Baltimore, Md.

Speaking Tubes.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.
Wollensak, J. F., Chicago, Ill.

Specialties, Pat. Articles.
Konigslow, O., Cleveland, O.

Speed Indicators.
Church & Sleight, 103 Fulton St., N. Y.

Spelter.
Mathlessen & Hegeler Zinc Co., La Salle, Ill.

Spoons and Forks.
Boardman, L. & Son, New Haddam, Conn.
Holmes & Edwards Silver Co., Bridgeport, Conn.
Rogers, The Wm. Mfg. Co., Hartford, Conn.
Rogers & Hamilton Co., Waterbury, Conn.

Sporting Goods.
Hartley & Graham, 313-315 B'way, N. Y.

Springs.
American Spiral Spring Co., Pittsburgh, Pa.
Cary, Alanson, 240-242 W. 29th St., N. Y.
Dunbar Bros., Bristol, Conn.
Miller & Van Winkle, Brooklyn, N. Y.
Morgan Spring Co., Worcester, Mass.
Nourse, Fred Co., 315 to 319 E. 22d St., N. Y.
Roland, Wm. & Harvey, Phila., Pa.
Sabin Machine Co., Montpelier, Vt.
Washburn & Moen Mfg. Co., Worcester, Mass.
Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Spring Hinges.
Bardeley, J., 149 & 151 Baxter St., N. Y.
Chicago Spring Butt Co., Chicago, Ill.
Fullman Sash Balance Co., Rochester, N. Y.
Stover Mfg. Co., Freeport, Ill.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

Sprinklers.
Smith, Oliver A., Clarkston, Mich.

Stamped Ware.
Am. Stamping Co., 104 & 106 John St., New York.

Stamping Works.
Cleveland Stamping & Tool Co., Cleveland, O.

Staples.
Cobb & Drew, Plymouth, Mass.
Titchener E. H. & Co., Binghamton, N. Y.

Steam Gauges.
Ashcroft Mfg. Co., 111 Liberty St., N. Y.
Bristols Mfg. Co., Waterbury, Conn.

Steam Hammers, &c., Makers of.
Dienelt & Eisenhardt, Philadelphia.
Dudgeon, Richard, 24 Columbia Street, N. Y.
Trethewey Mfg. Co., Pittsburgh, Pa.

Steam Heating.
Webster Warren & Co., Camden, N. J.

Steam Separators.
Goubert Mfg. Co., 32 Cortland St., N. Y.
Harrison Safety Boiler Works, Phila., Pa.

Steel Balls.
Grant Anti-Friction Ball Co., Fitchburg, Mass.

Steel, Cold Rolled Strip.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel Figures and Alphabets.

Krogsrud, W., 61 Fulton, N. Y.

Steel Importers.

Abbott, Wheelock & Co., N. Y. and Boston.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Milne, A. & Co., 1 Broadway, N. Y.
Newton & Shipman, 83 John, N. Y.
Wetherell Bros., 93 Liberty St., N. Y.
Whitney, A. R. & Co., B'way, N. Y.
Wolff, R. H. & Co., Ltd., 118th Street and Harlem River, N. Y.

Steel (Mushet's Special).

Jones, B. M. & Co., Boston.

Steel Manufacturers.

Atlas-Standard Iron & Steel Co., Bridgeport, O.
Bethlehem Iron Co., S. Bethlehem, Pa.
Baker, Hermann & Co., 103 Duane St., Carbon Steel Co., Pittsburgh, Pa.
Chester Steel Castings Co., Phila., Pa.
Chrome Steel Works, Brooklyn, N. Y.
Crescent Steel Co., Pittsburgh, Pa.
Eiken & Co., Hagen, Germany.
Frankford Steel Co., Philadelphia.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.
Hobson, Francis, Seaman & Co., 97 John St., N. Y.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Kayser, Ellison & Co., Sheffield, Eng.
La Belle Steel Co., Pittsburgh, Pa.
Lukens Iron & Steel Co., Coatesville, Pa.
Moorehead-McCleane Co., Pittsburgh, Pa.
Moss, F. W., 83 John, N. Y.
Naylor & Co., 45 Wall, N. Y.
Pottsville Iron and Steel Co., Pottsville, Pa.
Reilly, J. W., Fort Hunter P. O., Pa.
Rowland, Wm. & Harvey, Frankford Philadelphia.
Singer, Nimick & Co., Pittsburgh.
Stanley Works, New Britain, Conn.
Steel & Iron Improvement Co., Pittsburgh, Pa.
Taylor Iron & Steel Co., High Bridge, N. J.
Wordlaw, S. & C., Sheffield, Eng.
Wetherell Bros., 93 Liberty, N. Y.
Wilmot & Hobbs Mfg. Co., Bridgeport, Conn.

Steel, Manufacturers' Agents.

Barnes, C. K. & Co., Philadelphia, Pa.
Corning, Edw. & Co., 29 B'way, N. Y.
Frasse Co., 19 Warren St., New York.
Lindsay, Jas. G. & Co., Phila., Pa.
Pierson & Co., 29 Broadway, N. Y.

Steel Rails, Manufacturers of.

Bethlehem Iron Co., S. Bethlehem, Pa.
Cambria Iron Co., Johnstown, Pa.
Montour Iron & Steel Co., Danville, Pa.
Riverside Iron Wks., Wheeling, W. Va.

Steel, Tool.

Frankford Steel Co., Philadelphia, Pa.
Jessop, Wm. & Sons, Sheffield, England, or 91 John, N. Y.
Jones, B. M. & Co., Boston, Mass.
La Belle Steel Co., Pittsburgh, Pa.

Steel Wheels.

Lillenberg, M. N., 150 Broadway, N. Y.

Step Ladders.

Bicycle Step Ladder Co., Chicago, Ill.
Croissant, M., Albany, N. Y.

Stocks and Dies.

Armstrong Mfg. Co., Bridgeport, Conn.
Billings & Spencer Co., Hartford, Conn.
Butterfield & Co., Derby Line, Vt.
Hart Mfg. Co., Cleveland, O.
Saunders' Sons, D., Yonkers, N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Stove Linings.

Ostrander Fire Brick Co., Troy, N. Y.

Stove Pipe Thimbles.

Cheney, S. & Son Manlius, N. Y.

Stove Trimmings.

Troy Nickel Works, Troy, N. Y.

Street Lamps.

Steam Gauge & Lantern Co., Syracuse, N. Y.

Strops.

Electric Cutlery Co., 113 Chambers, N. Y.
J. R. Torrey & Co., Worcester, Mass.

Structural Iron Work.

Berlin Iron Bridge Co., East Berlin, Conn.
Boston Bridge Wks., Boston, Mass.
Lindsay, Jas. G. & Co., Phila., Pa.
Wrought Iron Bridge Co., Canton, O.

Sulphuric Acid.

Mathlessen & Hegeler Zinc Co., La Salle, Ill.

Tacks, Brads, Staples, &c.

Atlas Tack Corporation, Boston, Mass.
Clendenin Bros., Baltimore, Md.
Cobb & Drew, Plymouth, Mass.
Grand Crossing Tack Co., Grand Crossing, Ill.
Nat. Screw & Tack Co., Cleveland, O.
Phillips, E. & Sons, South Hanover, Plymouth Mills, Plymouth, Mass.
Trufant, W. E., Whitman, Mass.

Taps and Dies.

Eutterfield & Co., Derby Line, Vt.
Carpenter, J. M., Tap & Die Co., Pawtucket, R. I.
Manning, Maxwell & Moore, 111 Liberty St., N. Y.
Wells Bros. & Co., Greenfield, Mass.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Testing Laboratories.

Riehle Bros. Testing Mch. Co., Philadelphia.

Testing Machines.

Riehle Bros. Testing Mch. Co., Phila.

Theatrical Hardware.

Wollensak, J. F., Chicago, Ill.

Thill Springs.

Frost Thill Spring Co., Boston, Mass.
Sabin Machine Co., Montpelier, Vt.

Time Record.

Scattergood, H. W., Phila., Pa.

Tinners' Hardware.

Serger Bros., Philadelphia, Pa.

Tin Plate Machinery.

Lloyd Booth Co., Youngtown, Ohio.

Tinware.

Am. Stamping Co., 104 & 106 John St., N. Y.

Tire Upsetters.

Butts & Ordway, Boston, Mass.

Tee Calks, Steel.

Burke, P. F., Boston, Mass.

Tool Chests.

Am. Tool Co., 200 W. Houston St., N. Y.

Tools.

Britton, Horace E., Stoughton, Mass.
Brown, R. H. & Co., New Haven, Conn.
Frasse Co., 19 Warren St., New York.
Mayhew, H. H. Co., Shelburne Falls, Mass.
Millers Falls Co., 98 Reads, N. Y.
Richardson, C. F. & Son, Athol, Mass.
Standard Tool Co., Athol, Mass.
Stanley Rule & Level Co., 29 Chambers, Starrett, L. S., Athol, Mass.

Tools, Blacksmith and Wheelwrights.

Buffalo Forge Co., Buffalo, N. Y.
Butts & Ordway, Boston, Mass.
Champion Blower & Forge Co., Lancaster, Pa.
Plumb, Fayette R., Philadelphia, Pa.
Wiley & Russell Mfg. Co., Greenfield, Mass.

Tools, Steam and Gas Fitters'.

Saunders' Sons, D., Yonkers, N. Y.

Torches, Oil and Gasolene.

Danier Stove & Mfg. Co., Cleveland, O.
Schneider & Trenkamp Co., Cleveland, Ohio.
Standard Lighting Co., Cleveland, O.

Transom Lifters.

Wollensak, J. F., Chicago, Ill.

Trucks, Manufacturers of.

Berger Bros., Philadelphia, Pa.
Boston & Lockport Block Co., Boston, Mass.
Clark, G. P., Windsor Locks, Conn.
Lansing Wheelbarrow Co., Lansing, Mich.

Tubes, Seamless Drawn Copper.

Ansonia Brass & Copper Co., 19 and 21 Cliff, N. Y.
Randolph & Clowes, Waterbury, Conn.

Tubes, Steel.

Leng's John S. Son & Co., 4 Fletcher St., New York.
Mannesmann Tube Co. Ltd., Landore, England.

Tumbling Barrels.

Henderson Bros., Waterbury, Conn.

Tarn Buckles.

Cleveland City Forge & Iron Co., Cleveland, O.
Merrill Bros., Brooklyn, E. D.

Twist Drills, Makers of.

Cleveland Twist Drill Co., Cleveland.
Morse Twist Drill & Machine Co., New Bedford, Mass.
New Process Twist Drill Co., Taunton, Mass.
Standard Tool Co., Cleveland.

Valves, Gas, Water and Steam.

Best, Fox & Co., Pittsburgh, Pa.
Chapman Valve Mfg. Co., Boston.
Eynon-Evans Mfg. Co., Philadelphia.

Jenkins Bros.,

71 John, N. Y.

McNab & Harlin Mfg. Co.,

66 John N. Y.

Mason Regulator Co.,

Boston, Mass.

Ventilator Appliances.

Howard & Morse, 45 Fulton, N. Y.

Vise Jaws.

Newark Mch. Tool Co., Newark, N. J.

Vises.

Capital Mch. Tool Co., Auburn, N. Y.
Holland Mfg. Co., Erie, Pa.
Howard Iron Works, Buffalo, N. Y.
Millers Falls Co., 98 Reads St., N. Y.
Prentiss Vise Co., 44 Barclay N. Y.
Van Wagoner & Williams Co., 14 Warren St., N. Y.

Wagon Jacks.

Boston & Lockport Block Co., Boston, Mass., and Lockport, N. Y.
Covert Mfg. Co., West Troy, N. Y.
Covert's Saddlery Works, Farmer, N. Y.

Washers.

Ellis, Wm. H. Co., Pawtucket, R. I.

Milton Mfg. Co., Milton, Pa.

Sternbergh, J. H. & Son, Reading, Pa.

Water Meters.

Worthington, Henry R., 86 & 88 Liberty St., N. Y.

Water Wheels.

Poole, Robt. & Son Co., Baltimore, Md.

Wheelbarrows.

Akron Tool Co., Akron, O.
Amer. Steel Scraper Co., Sidney, Ohio.

Cookburn Barrow & Moh. Co.,

Jersey City, N. J.

Kilbourne & Jacobs Mfg. Co.,

Columbus, Ohio.

Lansing Wheelbarrow Co.,

Lansing, Mich.

Sidney Steel Scraper Co.,

Sidney, O.

Whips.

American Whip Co., Westfield, Mass.

Window Cord, Makers of.

Samson Cordage Works, Boston, Mass.

Wire, Manufacturers of.

Amer. Spiral Spring Co., Pittsburgh, Pa.

Consolidated Steel & Wire Co., St. Louis, Mo.

Gautier Steel Department of Cambria Iron Co., Johnstown, Pa.

Miller & Van Winkle, Brooklyn, N. Y.

New Castle Wire Nail Co., New Castle, Pa.

New Haven Wire Mfg. Co., New Haven, Conn.

Salem Wire Nail Co., Salem, O.

Trenton Iron Co., Trenton, N. J.

Washburn & Moen Mfg. Co., Worcester.

Wetherell Bros., 93 Liberty St., F. Y.

Wolff, R. H. & Co., Ltd., 118th St. and Harlem River, N. Y.

Wright & Colton Wire Cloth Co., Worcester, Mass.

Wire Cloth.

Barnum, E. T., Detroit, Mich.

Clinton Wire Cloth Co., Clinton, Mass.

Darby, Edward & Sons, Philadelphia.

Ester, W. S., 65 Fulton, N. Y.

Gilbert & Bennett Mfg. Co., 42 Cliff, N. Y.

Howard & Morse, 45 Fulton, N. Y.

N. J. Wire Cloth Co., Trenton, N. J.

Reliance Wire & Iron Wks., Milwaukee, Wis.

Scheeler & Sons, Buffalo, N. Y.

Wickwire Bros., Portland, N. Y.

Wright & Colton Wire Cloth Co., Worcester, Mass.

W. S. Tyler Wire Works Co., Cleveland, O.

Wire Cutters.

Healy, C. J., 108 Chambers St., N. Y.

Higginson Hdw. Co., Higganum, Conn.

King, J. M. & Co., Watertown, N. Y.

Wire Dies.

McFarland, Wm., Trenton, N. J.

Newton & Shipman, 83 John, N. Y.

Wire Door Mats.

Hartman Mfg. Co., Elwood City, Pa.

Horrocks, Joshua, 45 Cliff St., N. Y.

Wire Fences.—See Fencing, Iron and Wire.

Wire Goods, Manufacturers of.

Darby, Edward & Sons, Phila.

Gilbert & Bennett Mfg. Co., 42 Cliff St., N. Y.

Ludlow-Saylor Wire Co., St. Louis.

Ossawan Mills Co., Norwich, Conn.

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Bevin Bros. Mfg. Co.....	73	Clendenin Bros.....	13	F. & N. Mfg. Co.....	90	Hulbert Bros. & Co.....	99
Bickford Drill & Tool Co.....	42	Cleveland Block Co.....	82	Fairmount Machine Co.....	49	Hunt, Robert W. & Co.....	56
Bicycle Step Ladder Co.....	79	Cleveland City Forge & Iron Co.....	1	Fearing, Wm. S.....	2	Ideal Mfg. Co.....	73
Bigelow, C. R.....	53	Cleveland Rubber Works.....	77	Ferdinand, L. W. & Co.....	73	Illinois Pure Aluminum Co.....	38
Biggall & Keeler Mfg. Co.....	43	Cleveland Stamping & Tool Co.....	75	Field, Alfred & Co.....	68	Indiana Wire Fence Co.....	4
Billings & Spencer Co.....	86	Cleveland Stone Co.....	50	Fitch, W. & E. T.....	92	Ives, H. B. & Co.....	36
Bingham, W. Co.....	20	Cleveland Twist Drill Co.....	47	Fitchburg Machine Works.....	42	Jacobus, W. H.....	92
Birmingham Iron Foundry.....	75	Clinton Wire Cloth Co.....	8	Fitzsimons & Co.....	18	Jarecki Mfg. Co.....	41
Bissell, E. Son & Co.....	55	Cobb & Drew.....	13	Flagg, Stanley G. & Co.....	100	Jeffrey Mfg. Co.....	37
Blake & Johnson.....	13	Cockburn Barrow & Machine Co.....	68	Foos Mfg. Co.....	88	Jenkins Bros.....	1
Bliss Co., E. W.....	39	Coes, Loring & Co.....	87	Forehand Arms Co.....	75	Jenkins & Lingle.....	40
Boardman, L. & Son.....	73	Coes Wrench Co.....	87	Fram, E. T.....	2 & 80	Jenner, H. W. T.....	6
Bogert, John L.....	50	Coffin & Leighton.....	41	Frankford Steel Co.....	20	Jessop, Wm. & Sons.....	19
Boker, Hermann & Co.....	19	Colburn, A. M.....	45	Franklin, H. H. Mfg. Co.....	54	Johns, H. W. Mfg. Co.....	16
Boone, W. C. Mfg. Co.....	26	Colburn Electric Mfg. Co.....	30	Frassco Co.....	82	Johnson, I. G. & Co.....	100
Booth, The Lloyd Co.....	27	Colby Wringer Co.....	79	Frost Thill Spring Co.....	21	Johnson, I. H., Jr., & Co.....	50
Borden & Lovell.....	7	Coldwell Lawn Mower Co.....	27	Fulton Iron & Engine Works.....	49	Johnson, S. C.....	81
Borgner, Cyrus.....	27	Colliau, Victor.....	29	Gardner, Jas. & Son.....	26	Jones, B. M. & Co.....	22
Boston Bridge Works.....	16	Conroy, P. J. & Co.....	82	Garrison, A., Foundry Co.....	25	Jones, Jesse & Co.....	66
Boston Gear Works.....	34	Consolidated Steel & Wire Co.....	15	Garry Iron & Steel Rfg. Co.....	9	Jones & Lamson Machine Co.....	53
Box, Alfred & Co.....	48	Continental Iron Works.....	33	Gartland Foundry Co.....	28	Kayser, Ellison & Co.....	19
Boyce Rivet Co.....	100	Corbin, P. & F.....	78	Garvin Machine Co.....	53	Keeley, Jerome & Co.....	18
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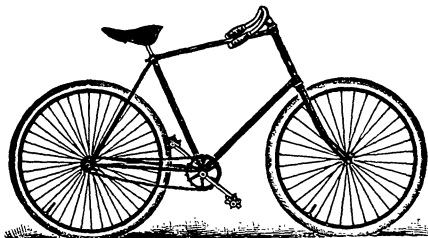
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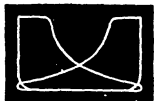
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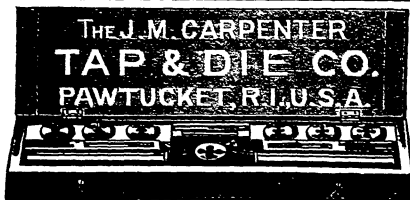
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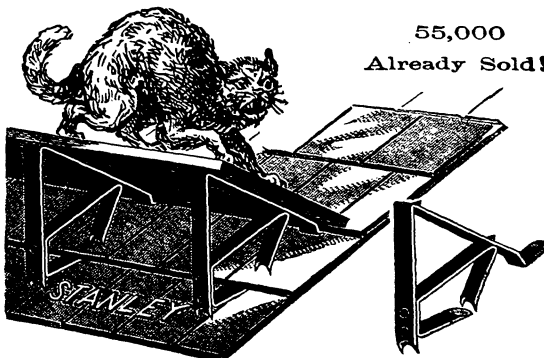
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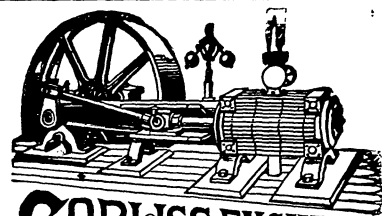
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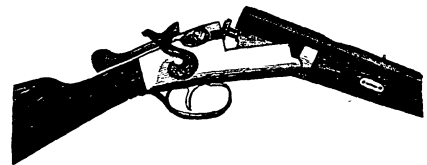
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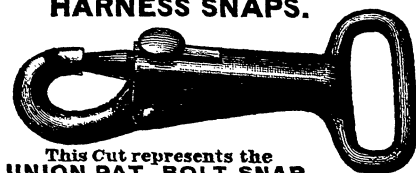
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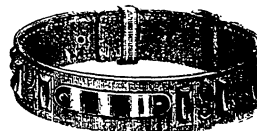
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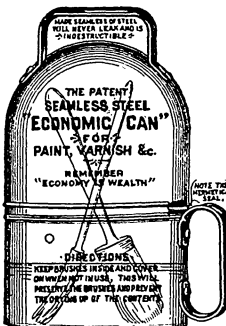
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THE IRON AGE

THURSDAY, OCTOBER 26, 1893.

A 1200 Horse-Power Turbine for Niagara.

Another large water wheel has just been shipped to Niagara Falls by James Leffel & Co. of Springfield, Ohio. It is a duplicate and of nearly the same power as one which was shipped some six months ago to the Cliff Paper company and is intended for the same parties. The wheel is of the new type, on horizontal shaft, and is known as the James Leffel double discharge turbine,

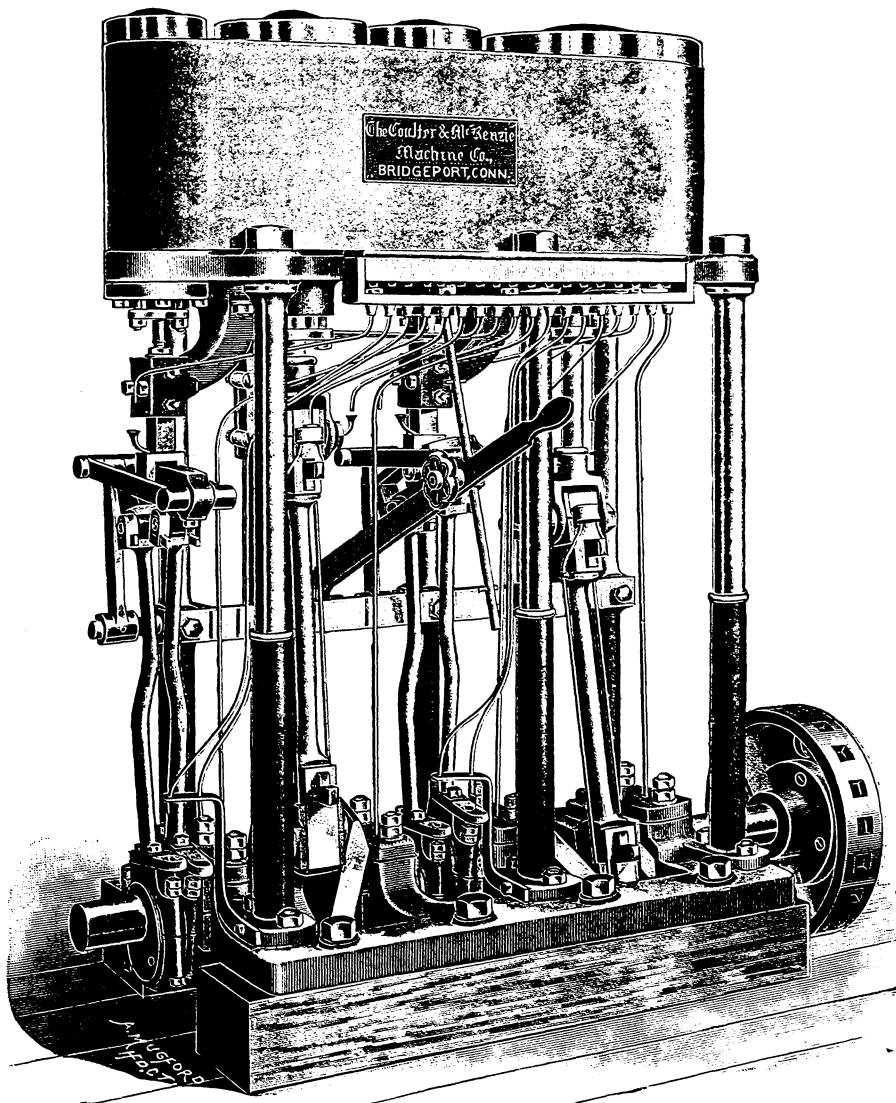
with a heavy iron center. The wheel will connect direct to the wood grinding machine. The company have just completed a very original and unique design of wheel plant for another New York company. It comprises four wheels in one system, being a quadruple wheel of 1000 horse-power, to operate under a 40 foot head.

Baltimore had last week a practical illustration of the dangers lurking in overhead electric wires, when a large

The Steam Yacht "Dream."

Our illustrations show the most essential features of what is stated to be the largest and fastest steamboat ever built in Bridgeport, Conn. It was designed for G. W. Hills, proprietor of the *Evening Post* of that city. It is 60 feet long over all, 12 feet beam and 5 feet depth and draws 20 inches forward and 3 feet 4 inches aft.

The power required is supplied by water tube boiler of the Herreshoff type,



THE STEAM YACHT "DREAM."—The Engine.

the entire weight being 30 tons. The water will be conducted to the wheel from a canal at the top of the cliff by an 8-foot pipe, extending downward until it reaches the mill, located near the foot of the cliff. The water will enter the cylinder casing of the wheel from below, passing upward a few feet, filling the case, and thus obtaining the head pressure. The amount of head will be about 130 feet; the wheel being some 67 inches in diameter, a speed of 225 revolutions will be obtained and almost or quite 1200 horse-power developed. The runner is made of bronze,

blaze, which spread to the jail and entailed some loss of life, was started by electric wires being blown together during a gale. The cross currents burned out the wires, which fell and set fire to adjoining wood work.

A large deal in lumber is reported from Bangor, Maine, between 10,000,000 and 15,000,000 logs having been sold a few days ago to a syndicate for \$100,000 to \$150,000 cash. The price was \$8 to \$10 per 1000, the lowest known since the war.

which is of ample size and is fed by a Marsh steam pump. A Worthington double acting vacuum pump controls a keel condenser consisting of 48 feet of 3 inch pipe.

The engine, as shown in the prospective view and in the sectional drawings, Figs. 3 and 4, is a fore and aft compound, designed and built by the Coulter & McKenzie Machine Company of Bridgeport. It is capable of furnishing 75 horse-power, and will turn a 3 foot screw of 4 feet 7 inches pitch 250 turns per minute with 100 pounds of steam. The high pressure cylinder

is 6 inches in diameter, the low pressure 12 inches and the stroke 9 inches. Both cylinders, as shown plainly in Fig. 3, are cast in one piece. The exhaust from the high pressure cylinder passes around that cylinder and into the low pressure valve, thus making a receiver and jacket in one and permitting the passage of steam to the low pressure cylinder without piping.

The pistons are fitted with a sectional Dunbar packing, consisting of a solid

rings are cut in three or four segments, as may be desired, and are adjusted so

diameter equal to the inside width of the rings. This construction insures

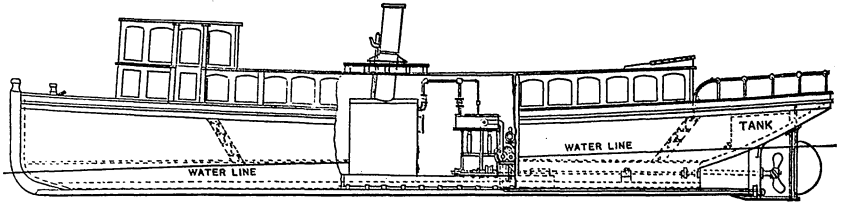


Fig. 2.—Longitudinal Section.

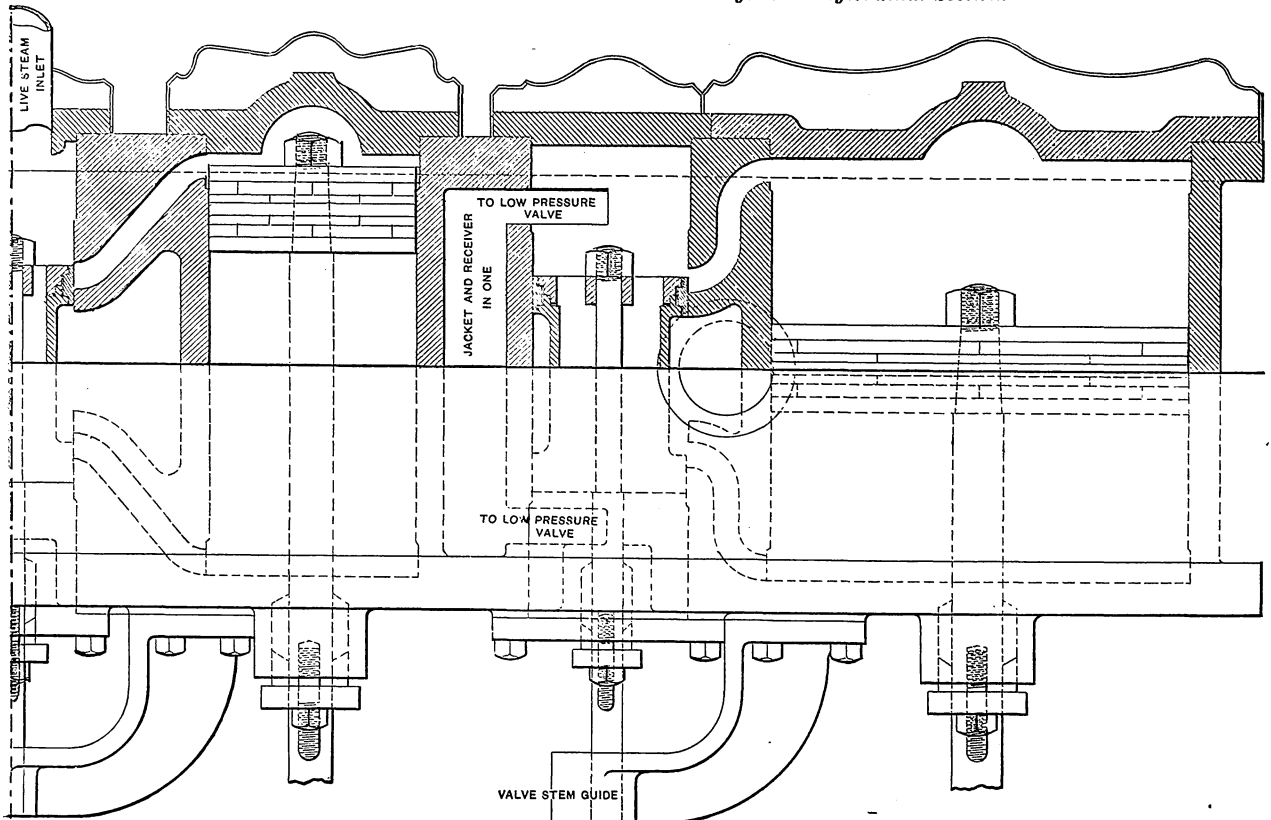


Fig. 3.—Vertical Section through Cylinders.

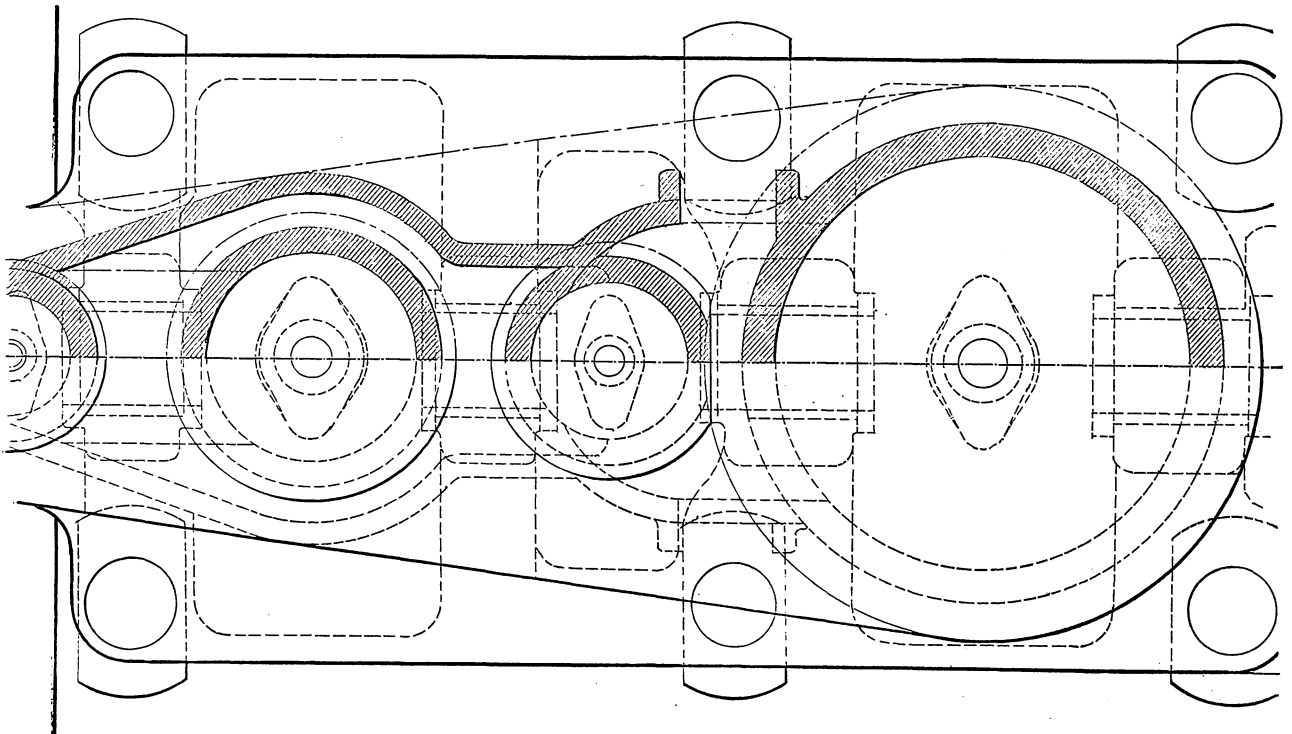


Fig. 4.—Sectional Plan of Cylinders.

THE STEAM YACHT "DREAM."

center, or "bull" ring, on each side of which is fitted an L-shaped ring and a square ring, as shown in Fig. 5. These

as to break joints. The rings are pressed against the walls of the cylinder by means of round wire springs of a

even and sufficient pressure of the rings against the cylinder.

The valves are of the balanced piston

type, made up of a center and two end pieces held together by the valve stem and fitted with a steam tight ring on each end. The live steam enters on the top of the valve, passes through the center and enters the cylinder from each end, the exhaust steam passing around the center, as will be understood from Fig. 3. The valves are operated by a Stevenson link motion, the connections of which have every adjustment. The link blocks are bronze bushed, with a hardened and ground steel bush working on a hardened steel pin. The links are made in halves and bolted together.

The cylinders are supported upon six steel columns which are securely fastened to a substantial cast iron bed piece, making a frame which permits ready access to every part of the engine for repairs or adjustment.

All the rods, connections and links have every means of adjustment for tak-

bearing is filled with oil, so that the parts are constantly lubricated and friction is reduced to a minimum.

On the front and bottom of the cylinders is a reservoir for oil, under which there is fitted a trough holding 18 separate pipes which carry the oil to the different bearings. All the bearings are also provided with separate oil holes to be used in case of need.

The unofficial speed trial of the United States cruiser "Columbia," the first of the new triple screw commerce destroyers, took place outside the mouth of the Delaware River on October 18, and resulted in the attainment of the very satisfactory record of 21.5 knots an hour. The contract speed was 21 knots; and it is anticipated by the builders that this speed will be exceeded, on the official trial, by a knot or a knot and a half. The Cramps,

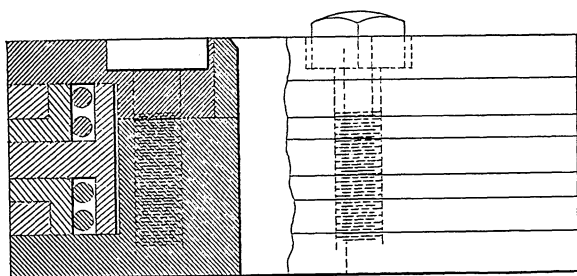


Fig. 5.—Section Showing Piston Packing.

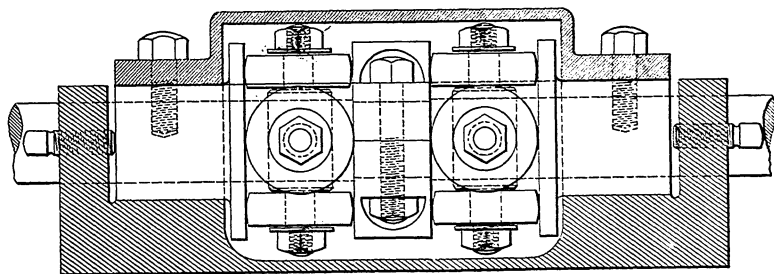


Fig. 6.—Longitudinal Elevation of Thrust Bearing.

ing up wear. The shaft is of steel $3\frac{1}{4}$ inches in diameter and has bearing surface of 18 inches on the bed. The crank pins are $2\frac{1}{4}$ inches in diameter by 3 inches long, and are set at an angle of 90 degrees. The shaft is fitted with a fly wheel which is also used to balance the two cranks and forms one-half of the coupling connecting the wheel shaft. The cylinders and their heads are neatly incased with German silver covers.

The propeller shaft is fitted with a patented roller thrust bearing of new design, shown in Figs. 6 and 7. It consists of a box casting, in which are fitted two bearings, one on each end. Centrally between these bearings is a thrust collar clamped rigidly to the shaft. On each side of this thrust collar is a loose steel collar having four projecting arms or studs on which rollers are loosely mounted. The thrust of the shaft is received by these rollers, which are turned slightly rounding on the face so as to overcome the sliding motion that would occur if they were flat. One set of these rollers acts when in head motion and the other when in back motion. The box containing this

therefore, are certain of securing a substantial premium.

The fact that several non-union rolling mills west of the Alleghenies are having their puddling done for \$4 per ton is troubling those operators who signed a \$5 scale several weeks ago. They have asked their workmen to make a concession, but so far none of them have signified their willingness. They say that they are sorry to learn that their employers cannot compete with non-union mills, but they do not offer the requisite remedy.

Some of the English newspapers print a letter from Thomas Hampton, Grangeville, Millhouses, near Sheffield, in which claims are advanced in behalf of a new steel process. The absence of any data concerning the details of the process is striking. The simple statement is made that the pig is blown in the lime lined Bessemer converter, and that the point of the method is the elimination of sulphur from the desilicized and decarbonized metal during the after blow.

WORLD'S FAIR NOTES.

The display of steam pumps in Machinery Hall is extensive, as might be expected. In the center of the building a large water tank has been located for the purpose of supplying adjacent exhibitors who desired to display their apparatus in operation. The tank lies below the level of the floor and thus presents an opportunity for some spectacular features in the delivery of streams from numerous nozzles. While most of the pump exhibits are grouped about this tank, some very prominent manufacturers have located elsewhere, notably Henry R. Worthington of New York, whose great display of pumping machinery has been previously described in these columns. The Worthington pumps are in regular use supplying water for the general purposes of the exposition. There are other manufacturers whose pumps are found in use in the power house attached to Machinery Hall, no attempt being made at a display on the floor of the building. Among these may be named the Barr Pumping Engine Company of Germantown Junction, Philadelphia; Battle Creek Machine Company of Battle Creek, Mich.; George F. Blake Mfg. Company of New York; Blakeslee Mfg. Company of Duquoin, Ill.; Boyts, Porter & Co. of Connellsville, Pa.; M. T. Davidson of Brooklyn; Deane Steam Pump Company of Holyoke, Mass.; Hall Steam Pump Company of Pittsburgh; Knowles

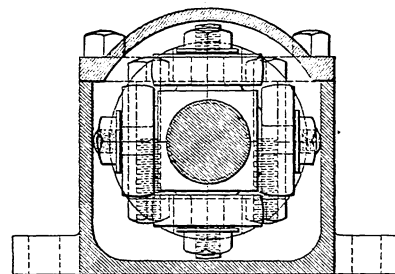


Fig. 7.—Cross Section of Thrust Bearing.

THE STEAM YACHT "DREAM."

Steam Pump Works of New York; Lawrence Machine Company of Lawrence, Mass.; Smedley Mfg. Company of Dubuque, Iowa; Snow Steam Pump Works of Buffalo, N. Y.; Sulzer-Vogt Machine Company of Louisville, Ky.; Joshua Thomas of Cleveland, Ohio; Wainwright Mfg. Company of Boston; N. A. Watson of Erie, Pa.; Wilson-Snyder Mfg. Company of Pittsburgh. The descriptions of regular exhibits are appended.

John H. McGowan Company

of Cincinnati, Ohio, and Richmond, Va., have taken unusual pains in fitting up an attractive display at Columns K and L 36. In the center of this large space they have erected a fountain with a glass dome, under which a constant stream of water is forced in a circular sheet by one of their twin lever valve pumps. Other pumps are in operation discharging streams of water in the great central tank. The pumps displayed comprise a number of patterns—direct acting, duplex, and crank and fly wheel types. There are also air pumps and hydraulic presses. The twin lever valve used in the company's duplex

pumps is a special device for which strong claims are made of positive action, securing exact work by both levers. It has been made to conform as nearly as possible to the action of the governor of a steam engine. The full power of the stroke is secured and provision is made to compensate for natural wear. A Glide direct acting pump is shown, which is a new pattern but recently brought out. In this the slide valve is actuated by a steam moved piston that reverses only at the completion of the stroke of the main piston. There are no outside valve movements. Suction and force pipe openings are on both sides, except in the case of the 10-inch stroke pumps, which have a T discharge on top that can be turned in any direction. The company have just bought the patterns, machinery, &c., for deep well pumps of the Bradford Well & Pump Company of Cincinnati, and will hereafter manufacture a line of such pumps in addition to their regular patterns. Some of the company's pumps are also at work in the boiler house.

Laidlaw-Dunn-Gordon Company

of Cincinnati, have a large working exhibit at Column I 33. There are 12 pumps in all, of which one is a compound 14 x 20 inches and 12 x 18 inches, throwing 2,000,000 gallons in 24 hours; six are standard duplex pumps of different sizes, ranging from 14 x 8 x 10 inches down to 4½ x 2½ inches. One is a single direct acting, 10 x 6 x 12 inches; two are deep well pumps, one of these being 8 inches diameter by 36 inches stroke and the other 5 x 24 inches; one is a fire pump 14 x 7 x 12 inches, throwing two streams into the great central tank from 1½ inch nozzles, discharging 500 gallons per minute. The company also have some of their pumps at work in the boiler house.

Joseph Menge

of New Orleans, La., shows a remarkably effective pump for certain classes of work at Column I 34. It consists merely of a bucket wheel, 20 inches in diameter by 6 inches in width, run by a belt, with a lifting capacity of 300,000 gallons per hour. It is adapted to irrigation or drainage purposes, and as shown in Machinery Hall, discharges a volume of water like a miniature Niagara.

Buffalo Steam Pump Company

of Buffalo, N. Y., at Column K 29, exhibit a number of duplex pumps, some of which are in operation. There are also single direct acting pumps, single cylinder air pumps and jet condensers. In this exhibit the water is pumped into an elevated tank which is used as a reservoir to show the action of a large hydraulic ram made by Rife's Hydraulic Engine Mfg. Company of Roanoke, Va. This ram forces a remarkably large stream of water through the top of a tall pipe. The company claim to manufacture hydraulic rams of larger capacity than any others in the world.

A. S. Cameron Steam Pump Works,

foot of East Twenty-third street, New York, have a large exhibit at Column K 31, while some of their pumps are also in active service in the boiler house. Pains are taken in this exhibit to show the system on which the Cameron pumps are built. Caps are removed and the interior mechanism is exposed, showing that there are very few working parts. In addition to regular pat-

terns, there are long stroke pumps for rolling mills or other service in which heavy continuous pumping is required; double plunger pumps, for feeding boilers under heavy pressure; mining pumps of the double plunger pattern; vertical mining pumps, for use in sinking or recovering shafts; direct acting vacuum pumps, for sugar refineries, glue factories, &c., and sugar refiners' vacuum pumps with fly wheel.

Gould Mfg. Company

of Seneca Falls, N. Y., are large exhibitors of pumps at Column B 47, also at J 28, in Machinery Hall, besides the boiler house, in Electricity Building, &c., but their exhibits have been previously described in these columns.

Geo. E. Nye

of 74 and 76 West Washington street, Chicago, makes an interesting exhibit at Column K 30. The Nye pump is of peculiar appearance, consisting of two rectangular chambers mounted on a tripod. These chambers are of cast iron. There are no pistons, but the pump is operated by the formation of a vacuum through the condensation of the exhaust steam. A small condensing chamber is placed in the rear of the two rectangular chambers. The parts are very simple, steam being admitted by a balanced automatic valve on the top of the chambers, while the suction and delivery ports are covered by four common claue valves. But little floor space is occupied, and a very small amount of steam is used. One of the pumps shown in operation works admirably with the supply pipe valve almost closed. It works so smoothly that it requires no bolting down, and it will pump from 40 to 60 per cent. of sand without injury. The exhibit includes a pump with a capacity of 1000 gallons per minute, which is the largest kept in stock. Larger sizes are made on special orders, from patterns on hand.

The Downie Pump Company

of New Brighton, Pa., make an exhibit at Column L 35 of pumps for deep wells. Their pumps are intended specially for artesian wells, but are adapted to any water service where the supply is obtained from wells. These pumps are shown in operation, and comprise double and single-acting for steam, belt or wind power.

Miller Steam Pump Company

of Dixon, Ill., make an exhibit at Column K 35 of duplex pumps for boiler feeding. One of these, 7 x 4½ x 8 inches, is shown in operation. Other pumps in the display, but not steam connected, cover much larger capacities. They are intended for either hot or cold water. The plunger is of new design, and there are other special features. Pumps of this company's make are also in use in the boiler house.

The Stillwell-Bierce & Smith-Vaile Company

of Dayton, Ohio, occupy a large space at Column J 37 in the display of their pumps and other specialties. A number of Smith-Vaile steam pumps of large capacities are shown, also Victor turbine wheels, the Stillwell live steam purifier, and the Stillwell close heater. This is a "still" exhibit, none of the machinery being shown in operation. Smith-Vaile pumps are, however, in use in the boiler house. The company have branch offices at 63 South Canal street, Chicago, and 112 Liberty street, New York.

Union Mfg. Company

of Battle Creek, Mich., make an interesting exhibit at Column S 30 of their Burnham and Frost pumps. The Burnham pumps shown are direct acting, boiler feed or pressure tank or light service, deep well and vacuum. The special feature of these pumps is an automatic device for creating a steam cushion to insure a uniform travel of the piston under varying degrees of load. The Frost boiler feed pumps shown are so constructed as to utilize the waste heat of the exhaust steam in heating the water on its way to the boiler. With this pump, therefore, the engine is not robbed of its power, as the exhaust steam is condensed and returned to be again used. R. J. Dillon & Co., 25 West Lake street, Chicago, are exclusive Northwestern agents for these pumps.

The Turner Machine Company

of 35 West Fourteenth street, New York, exhibited at Column I 34 rotary pumps, air compressors, painting machines and ice making machines. A rotary pump is at work pumping water on the coils of an ice making machine. This pump is of peculiar type, combining the qualities of a steam engine, water motor, fluid pump, air motor, vacuum pump and air compressor. Unlike all other rotary machines, the blade or gate is in contact with the casing or cylinder continuously. The shaft being set eccentric carries the drum, which in turn receives the blades or gates and permits them to slide back or forth as it revolves. These blades are connected by pins or bars piercing the shaft, so that they are practically solid from side to side. The casing is not a true circle but a curve made to accommodate the eccentricity, thereby gaining a practically solid piston moving in a rotary track without springs or valves. A positive air blower of small size is shown which is guaranteed to compress to 30 pounds in a steady blast. It is said to be the only rotary machine made that will do this work. Other sizes are made which will compress up to 300 pounds. One is at work compressing ammonia at 120 pounds in connection with an ice machine. An interesting part of the exhibit is one of the painting machines used in painting World's Fair buildings. The company's air compressor was used in operating this machine at the time, which was the first occasion of its application on a large scale to the painting of buildings.

The Deming Company

of Salem, Ohio, have a fine exhibit of steam and hand pumps at Column K 33, which has already been described in these columns. The display of hand and windmill pumps is worthy of notice in this connection. There are quite a number of exhibits of this character.

The Hayes Pump & Planter Company

of Galva, Ill., make a very good display at Column L 34. Their specialty is double cylinder pumps for hand or power. These are shown in a variety of sizes, some being in operation. There is also an array of force and windmill pumps of different styles arranged attractively. The company manufacture three and six cylinder power pumps for service in pumping a large volume of water.

Sandwich Enterprise Company

of Sandwich, Ill., make an exhibit at Column K 35. The special feature of this exhibit is an aerating pump, which

has but recently been brought out, for the purpose of purifying cistern water. It is an iron pitcher pump with the valves so arranged that they can be reversed by suitable levers. When reversed the pump works down instead of up and forces air into the cistern through the perforations in the lower part of the pipe. The reversing operation is almost instantaneous. The pump is shown in operation attached to a glass tank filled with water. Other pumps shown are windmill and force pumps in a variety of patterns.

Bucket Pump Company

of 441 Plum street, Cincinnati, also show purifying cistern pumps at Column K 29. One of these is in operation, with a dummy appropriately clad as a farmer's boy attached to the crank, so that he is constantly in motion, attracting much attention. The tank has glass sides to permit the aëration of the water to be seen. This pump has a series of buckets which conduct a supply of air into the water whenever the pump is at work.

H. Dickinson & Son

of Lowell, Lake County, Ind., exhibit another water purifying pump at Column L 34. This pump is composed of an endless chain, along which at regular intervals galvanized iron buckets are attached. Each of these cups is perforated at the bottom to allow the gradual escape of air from it as it goes bottom upward into the water. The bottom wheel is of such construction that it becomes an agitator also and assists in purifying the water. One of these is shown in operation in a glass inclosed tank.

The Rider Engine Company

of Walden, N. Y., have a very fine exhibit at Column K 36 of Rider and Ericsson hot air pumping engines. Many of these are in operation, the air being heated by gas jets. Some of them are used to force water to a considerable elevation. Familiar as these engines have now become in most sections of the country, the exhibit is constantly surrounded by groups of eager observers to whom the motive power is a deep mystery. The company have branch offices at 37 Dey street, New York, and 88 Lake street, Chicago.

The Penberthy Injector Company

of Detroit, Mich., make one of the prettiest exhibits to be found in Machinery Hall. It is located at Column N 24. Here the company have erected an ornamental booth having a cornice of oil cups, while the front railing is composed of injectors and ejectors neatly woven together, combining strength and beauty, the different parts being alternately gold and silver plated. A small engine and boiler built by the Lenox Machine Company of Marshalltown, Iowa, stand in the rear of the exhibit, equipped with Penberthy injector, ejector and oilers ready for use, but owing to the usual heat of Machinery Hall it has not been found desirable to keep the plant in operation. Attractively arranged on pyramidal shelves are handsome specimens of Safety wrist-pin oilers, XL injectors, IXL spring cover oilers and Penberthy injectors in a wide range of sizes. The company have only been in business seven years, but in that brief period they have put in use over 70,000 of their injectors, and are now shipping them all over the world. Their popularity is largely due to their simplicity. They

can be very easily taken apart to be cleaned and as readily put together again.

The Detroit Lubricator Company

of Detroit, Mich., also have a very pretty display at M 25. They have erected a handsome booth, the front of which is inclosed by a railing made of pipe fittings and hot water valves, the latter being so arranged that the hand wheels make effective decorations. The exhibit is composed of a great variety of locomotive and stationary lubricators, glass and brass oil cups, low water alarms and hot water valves. Among these are the Detroit improved cylinder lubricator, triple cylinder lubricator, air pump lubricator, automatic sight feed lubricators in several styles for various uses, glass body oil cups with index and sight feed, plain cylinder lubricators, plain brass oil cups, the Garfield automatic injector and quick opening radiator valves with and without union. These are arranged on show stands made of nickel plated tubing. The stands are tastefully designed, having numerous branches, some straight and others curved, to which goods are attached, resplendent in polished brass and nickel. Five awards have been bestowed on this company, covering their locomotive and stationary lubricators, glass and brass oilers, low water alarms and hot water valves. A medal and diploma were awarded their locomotive lubricator.

Schaeffer & Budenberg

of 66 John street, New York, make a fine display of their specialties at Column K 25. Quite a large space is here inclosed, on one corner of which they have erected an ornamental iron post fitted with a clock having faces on two sides, which are surrounded by several gauge faces, while a gilt eagle graces the top. A large vertical glass case in the center of the space contains specimens of many kinds of gauges, ranging from the largest sizes to the most diminutive ones. Among these are the new Columbian and Metropolitan pressure recording gauges for either fluids or gases. On shelves and stands are exhaust steam injectors, steam jet pumps, Holt's reducing valves and Acme steam traps.

Ashton Valve Company

of Boston exhibit at Column M 27 a great variety of safety valves, comprising pop safety valves for all sorts of boilers, noiseless safety valves for locomotive and marine boilers, relief valves for pumps and stand pipes and pressure and vacuum gauges. These are arranged on a large pyramid of shelves in the center of the space and on stands and shelves along the sides.

Hancock Inspirator Company

of Boston exhibit inspirators and ejectors at Column K 33. Numerous specimens of these devices for both locomotive and stationary boilers are shown on stands and platforms, and a practical exhibit is also made of two inspirators attached to a boiler and tank as in actual service. In connection with this exhibit specimens are shown of the Tripp metallic packing.

L. Schutte & Co.

of Philadelphia exhibit at Column M 26 a variety of their specialties, such as exhaust steam induction condensers, Korting's Universal double tube injectors, Universal syphons, hydraulic valves, &c. The special feature of this display is a 20-inch induction con-

denser, which is so large that a stairway has been built for visitors to reach the top of it. This condenser is intended for a 20-inch exhaust pipe.

The Notham Mfg. Company

of New York and Chicago have a large display at Column M 26 of oil cups for locomotives and stationary engines, injectors, ejectors, and other steam goods. The specimens of oil cups shown cover a very great range of sizes, from huge ones to the smallest kind in practical use.

Roe Stephens Mfg. Company

of Detroit, Mich., exhibit as the central feature of their display at Column M 29 a huge model of one of their Scott pop safety valves. It is mounted on a large platform, and is a conspicuous object in that portion of Machinery Hall. Grouped about the base of this structure are a great variety of specimens of Orme pop valves, Scott safety valves, check and gate valves, angle globe valves, Goldsmith throttle valves, &c.

Fisher Governor Company

of Marshalltown, Iowa, show at Column M 24 a full line of the now well-known Fisher steam pumping engine governors, gravity governors and reducing valves. Fourteen sizes of steam pump governors are shown, adapted to all the various uses and purposes for which steam pumps are used. Their function is to save the engineer the constant care of the throttle and to insure a uniform pressure at all times. In this way overpressure is prevented, which leads to the bursting of mains or hose during fire duty or of pipes or tanks or the flooding of floors. They are in growing use on hydraulic freight or passenger elevators. Two governors are shown for hydraulic pressure pumps, also three sizes of governors for fire pumps and steam pumps on automatic sprinkler systems, as well as those sizes of gravity governors for steam pumps filling elevated open tanks for elevator, house or factory use. The gravity governor automatically starts and stops the pump as may be necessary to keep the water at the height desired in the tank. Three sizes are further shown of reducing valves for steam, gas or air, which reduce initial pressure to any lower point desired and hold it uniformly.

Trimont Mfg. Company

of Roxbury, Mass., make an exhibit at Column M 31 of their Trimo wrenches. These wrenches are made with removable pipe jaws in a variety of sizes adapted to all classes of work. The Trimo combination wrench shown has double jaws, projecting on opposite sides, one set for plain work and the other for pipe.

The Brass & Iron Works Company

of Fostoria, Ohio, have a comprehensive exhibit at Column K 28. It covers a variety of tapping machines for tapping street mains, which are shown applied to pipes in position for work; a large number of well finished brass valves and couplings, and an array of special pipe fittings. These fittings are intended for use on iron pipe without cutting threads, and on lead pipe without the use of solder. The device is an ingenious one and accomplishes its purposes effectively. Another exhibit is a well drilling machine, with engine and tools complete, which stands ready to sink a well for natural gas, oil or water. There is also shown a line of Able's patent gate valves for water works service.

The Construction of Steamboats Navigating the Western Waters of the United States.—II.*

BY JOHN M. SWEENEY, WHEELING,
W. VA.

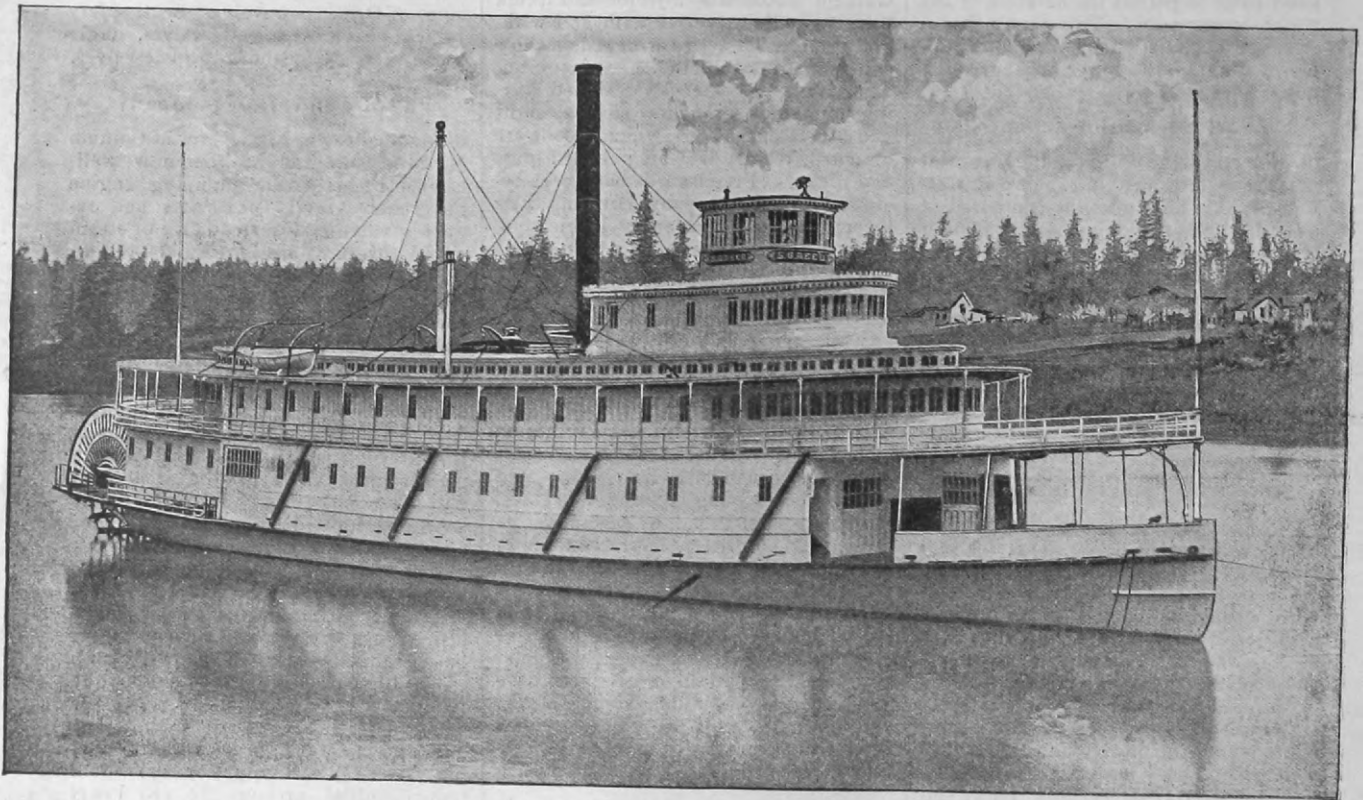
In the steam engineering department the rules of the United States Board of Supervising Inspectors of Steamboats adopted in 1873 work radical changes in construction. These rules, about coincident with the introduction of steam boiler plate, based the allowable working pressure of steam upon the tensile strength of the material. Now, a high steam pressure is the great desire of every boatman's heart, and at once the greatest tensile strength obtainable was demanded. Seventy thousand pounds was generally

In the first place, a furnace construction which will generate 90 or 100 pounds of steam working pressure with the greatest fuel economy will not generate 180 to 200 pounds with the greatest fuel economy; in fact, it usually will not generate the last pressure at all. Change of form is absolute, and ordinarily that form of furnace which makes the desired result with the least manipulation gives the best economy.

The plan of boiler most in use is the externally fired return flue type, shell 40 inches diameter, 24 feet long; two return flues 18 inches, sometimes 14 inches, diameter; shells 0.26 inch thick; flues 0.29 or 0.3 inch, when made in rings 24 inches long; rivet holes drilled, and longitudinal seams double riveted. This boiler receives certificates from the Government inspectors allowing, for 70,000 T. S., a maximum working pressure of 182

Much indirect harm is done by a requirement of the supervising inspectors that a water space of at least 3 inches should be preserved between the flues and shell, and between the flues themselves. Previous to this enactment about 1½ inches of space was the practice. The men who made these boilers had always used a 14 inch flue in a 40-inch shell, and they knew no other proportions. As a consequence, in order to comply with the new law, they raised the flues in the shell sufficiently to secure the required 3 inches of water space, and thereby vastly diminished the steam space, as well as curtailed the surface for the elimination of the steam.

There is one other form of boiler almost as popular as the double flued. The shell, 42 inches diameter, contains six 8 inch flues, in two rows of three each, the one flue immediately above the other. This gives easy access to every



S. S. S. G. REED (OREGON RIVER BOAT).
175 feet long, 32 feet beam, 6 feet hold.

adopted, but in some few cases 80,000 pounds was attempted. The amount of carbon, however, required in such plates at that period of steel plate development produced some very unsatisfactory results, and the further action of the supervisors requiring a reduction in area of at least 50 per cent. for plate 0.26 inch thick has brought the commercial product down to about 65,000 tensile strength.

Many reflections are cast upon the plan of boiler and furnace in use on the boats under discussion; and no doubt to the outsider, who never stood over a steam boiler with 200 to 225 pounds pressure on it all day, the forms used seem very crude and wasteful of fuel; but the fact remains that, while many radical changes have been proposed and attempted, the result has generally been a speedy return to the accepted form.

*From a paper read at the World's Engineering Congress before the Division of Marine and Naval Engineering and Naval Architecture. The proceedings of this division will be published in a bound volume by John Wiley & Sons, New York.

pounds, being one-sixth the ultimate bursting strain of the shell; but nothing has yet been devised to prevent the operators from exceeding this limit, and 200 to 225 pounds is frequently maintained.

There is always a disposition to do a little more work, particularly with tow-boats. The numerous pier bridges and dams placed in the river in recent years incite preparation to meet the demands in "running" them, and nothing comes nearer doing this than a "wad" of steam at the proper time. Fifteen years ago, with iron boilers of no defined tensile strength, 160 pounds was "big steam." Now the facts are as stated.

The evaporative duty of these boilers is about 7 pounds of water per pound of coal, and when compared, on a basis of the foot-pounds of work done per pound of fuel, show favorably with any water craft. The demand made upon boilers using the water of these silt-bearing streams is very heavy, and imposes conditions under which other forms, although possibly of better fuel duty, fail in points of service and steadiness.

part for cleaning and repair, and steams very well. One such boiler 18 feet long, 210 square feet heating surface, 20 square feet grate surface, is supplying two engines 10 inches diameter, 48 inch stroke, at an initial pressure of 170 pounds. The engines indicate an average of about 170 horse-power, and fuel consumption is 500 to 600 pounds per hour, or a result of 3 to 3½ pounds of coal per horse-power per hour.

Several cases of compounding have given a better result than this, but always at greater first cost, large additions in weight and cost for maintenance, and have generally been succeeded by direct high pressure in the next boat built by the same owners.

The large increase in working pressures of late years has demanded greater strength in the machinery and fastenings, and also in the hull construction, but the increase in weight has not been proportionate to the increased power developed, and the service has thereby been improved.

In a paper read before the American Society of Mechanical Engineers by the writer of this paper, and from which some

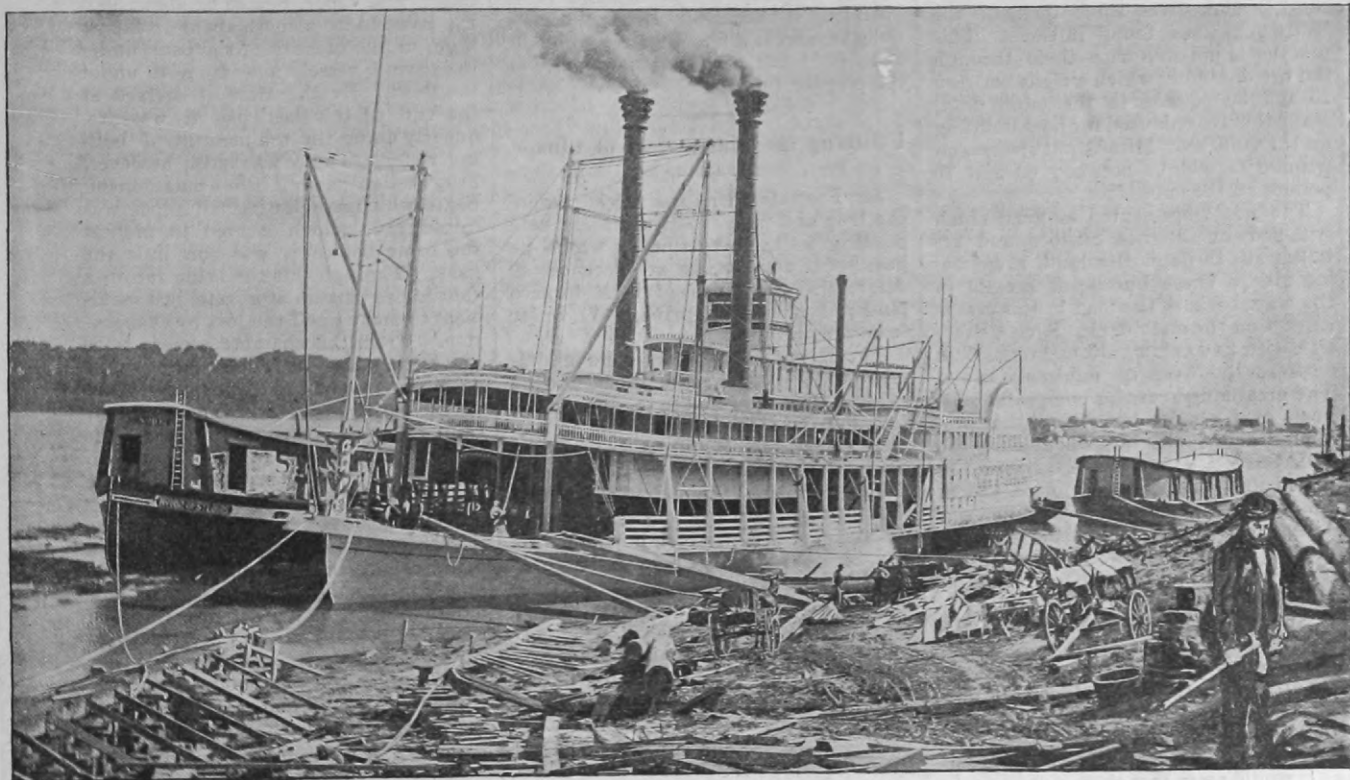
of the data herein are taken, an opinion was expressed that the improvement in the navigation of the Western waters of the United States would be found in the adoption of composite built boats, the frames and sides above the light

ful in general results, although open for future improvements in detail.

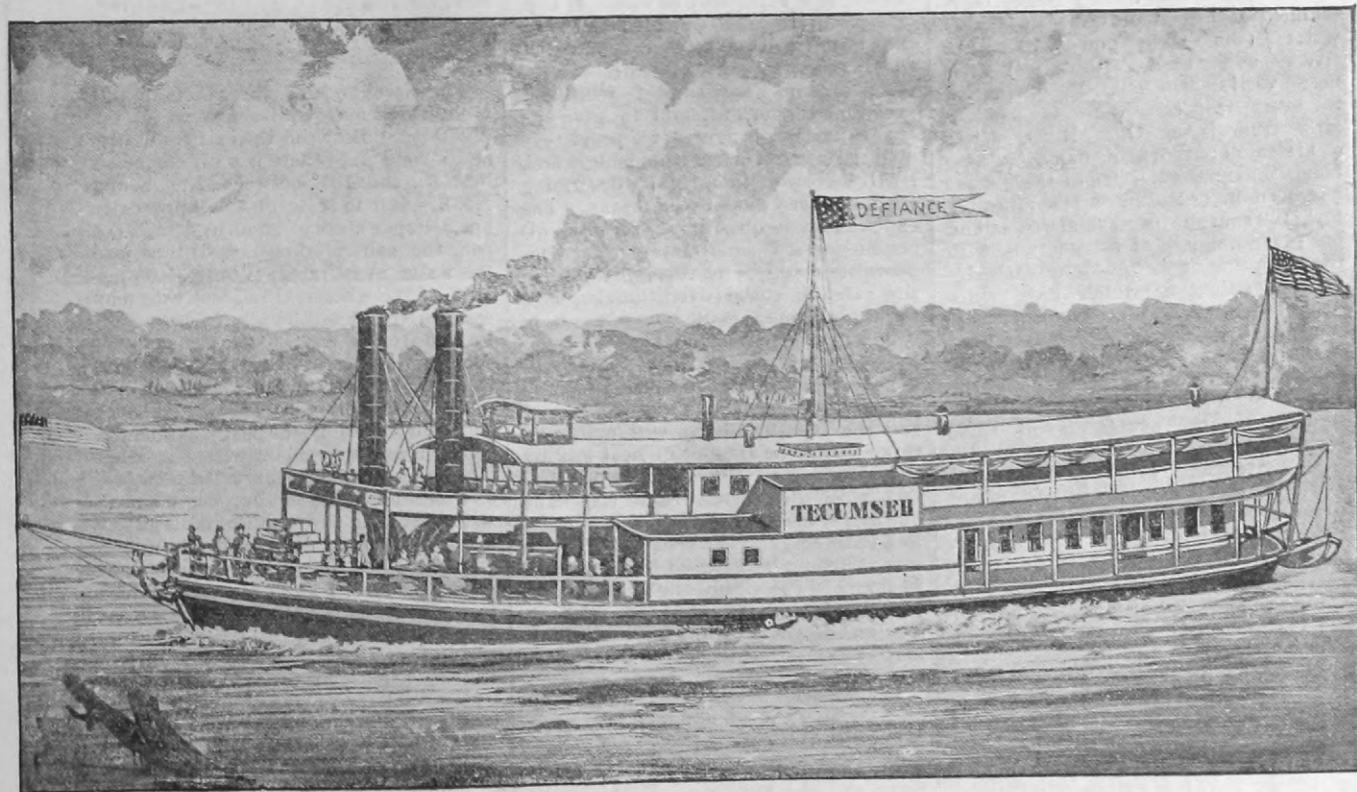
The mistakes, if any, have been in the direction of the use of too heavy steel for the frame construction. It has long been accepted as an axiom by

obtained with the stiff construction being in every case better than with the limber boat.

Reference has been made to the fact that light construction is essential for this class of craft, and that in under-



S.S. CITY OF HICKMAN.
Howard's Shipyard, Jeffersonville, Indiana.



S.S. TECUMSEH.
Made the trip from New Orleans to Louisville, in 1836, in 8 days and 4 hours.

draft line being of steel, the bottom and sides, up to the light line, of wood.

Since this opinion was given in the paper named several boats of this construction have been built, one by the writer, which has been entirely success-

ful in general results, although open for future improvements in detail. The mistakes, if any, have been in the direction of the use of too heavy steel for the frame construction. It has long been accepted as an axiom by

taking to develop an excessive amount of power, in proportion to the displacement or buoyancy of the boat, bad results have been obtained. For this reason the hull construction must be with a large number of dead flat frames in

order to preserve buoyancy. On some of the rivers of the Pacific Slope, especially the Oregon and Willamette, boats have been constructed on much better model and easier lines than any on the waters flowing into the Gulf of Mexico.

The accompanying engraving represents one of these boats, the "S. G. Reed," and gives some idea of the really fine lines found in them. This practice is possible with them through the use of timber which weighs between 25 and 30 pounds to the cubic foot, while the live oak used for boat building on the Ohio and Mississippi rivers and tributaries weighs between 60 and 70 pounds to the cubic foot.

The boat represented is very much stiffened by the use of fore and aft bulkheads through the hold, there being nine. These bulkheads are not in the way, because the load in this case is carried on the main deck. Such a practice with live oak would make the boat entirely too deep in minimum draft. The greater first cost for composite built boats over wooden boats is all that prevents their rapid introduction in the Ohio and Mississippi rivers, but it is to be hoped that this will not long stand in the way of their general introduction. There can be no question that the greater first cost is now justified in the long life and diminished cost of maintenance and repairs.

Not only is steel production diminished in cost, so that angles and shapes are coming into more general use for all purposes, and this increased output further assists to lessen the cost, but live oak timber is becoming less accessible, and is increasing in first cost.

It would seem that these causes ought soon to produce a result which would equalize the present cheapness of wood boats over composite boats at no distant date.

The work of the United States Government in the improvement of these waters (the Ohio and Mississippi rivers and their tributaries) has been vastly beneficial to navigation in every respect. This is particularly true of the Ohio River, where a system of movable dams is now being inaugurated. One of these dams has been in operation a few miles below Pittsburgh for several years, and has given unqualified satisfaction, with the exception of a few details in original construction, which have since been remedied. The second of these dams has now been authorized by Congress, and must necessarily lead finally to a complete system throughout the river. Such facilities will give a new impetus to the navigation of these waters, and an immense demand for increased tonnage will be the result. Through these means will no doubt come an intelligent improvement in respect to hull and machinery construction, with closer attention to fuel economy. The evolution is slow, but it is being evolved, and the time is not far distant when radical changes may be hoped for.

Since the preparation of this paper the writer is indebted to Capt. Ed. J. Howard, proprietor of Howard's shipyard, at Jeffersonville, Ind., opposite Louisville, Ky., on the Ohio River, for a photograph of the steamer "City of Hickman," and also for a photograph, made from a woodcut in Captain Howard's possession, of the steamboat "Tecumseh." Cuts of these boats are hereto appended, as indicating the change in dimensions and appearance between the two extremes of time, 1826 and 1892. The "Tecumseh" was built at Cincinnati, Ohio, in 1826; was

a single engine boat, and had the sleeping accommodations for passengers in the hold. She was a celebrated boat at the time, because of the fact that she made the run from New Orleans to Louisville in something over eight days. The "City of Hickman" is the property of the Anchor Line, operating between St. Louis and New Orleans, and is a fine illustration of the excellent boats used in that service at the present time.

Utilizing the Waste Heat of Cinder.

Sir Lowthian Bell has placed before the Iron and Steel Institute some data relating to the experiments which he has been conducting at Clarence, to utilize the waste heat of blast furnace cinder for boiling brine. We quote from it as follows:

The recent experiments were undertaken to ascertain whether the heat in the exhaust steam and that in the slag, taken together, may not be susceptible of useful application. My experience so far does not permit me to estimate with sufficient precision the actual amount of the heating value of either. That of the steam will depend on how much, if any, of its latent heat remains in what, more or less, is not steam properly so-called, but is chiefly vesicular water. Of the heat in the slag, I have, by plunging it into water, ascertained that during the time occupied in running it into the wagons for ease of transport a considerable quantity of its original heat has disappeared, but this will be a varying quantity, according to the time which elapses between the slag leaving the furnace and being applied to do work. Under any circumstances, the temperatures obtainable for direct application cannot be very high, because the steam cannot, it is supposed, be much, if anything, above 100° C. (212° F.), and the heat in the slag can only be slowly extracted. In the present state of our knowledge I will not, because I cannot, attempt to give you any satisfactory figures to prove the quantity of heat at our command, which I will leave you to infer by describing what has been done by its means. The experiments in question have been directed toward ascertaining what temperatures could be obtained by passing the exhaust steam over the slag balls during a time, be it remembered, in which it was performing its work and by so much being cooled. This will depend, of course, on the relative weights of steam and slag employed, and the rapidity of the current of the former, and the amount of heat lost by the latter before it is exposed in contact with the steam. Eight slag balls on their respective wagons were placed in a chamber, and the steam of 16 to 20 tons of water was passed over them in 24 hours. The steam might be heated considerably above 500° or 600° F. Within the limits which necessarily it may be most convenient to observe in such a system of recovering heat otherwise lost, we must endeavor to apply it where possible to such purposes as can be served with heat of moderate intensity. Such an instance can, I think, be found in the industry recently established at Middlesborough—viz., that of producing salt from brine. It was, indeed, from experience at the Clarence Works in the evaporation of brine that the idea of utilizing the heat daily going to waste at the blast furnaces suggested itself. In order to ascertain the precise rate at which steam super-

heated in the way alluded to performed its work, three pans, each 25 feet long by 21 feet broad, were erected. Under the first, eight hot balls were placed in two rows, iron doors were then closed and the exhaust steam admitted into the two compartments occupied by the slag. The vapor, heated to about 500° F., passed into a space about 18 inches high, of the breadth of the pan, under the second vessel, and from it under the third. By the time it arrived at the end of this last pan it was frequently under the temperature of boiling water. There was still, however, heat enough passing into a small chamber in which a coil of small pipes was introduced, which served to preheat the brine before it was run into the pans. Through this the brine ran in a continuous stream at a rate just sufficient to make good the loss by evaporation. From this chamber a mere trace of vapor made its appearance at the outlet; indeed, occasionally there must have been an influx of air caused by a vacuum due to the perfect condensation of the steam. So far as the figures at my disposal enable me to calculate, a furnace producing 500 tons per week may be regarded as probably being able to evaporate a quantity of brine equal to about 75 tons of salt or perhaps more. Taking one month when the average temperature of the superheated steam left the three pans, it had, after performing its duty under each, the temperatures stated, while the brine it had heated stood at the figures given in the following table:

	No. 1 pan.	No. 2 pan.	No. 3 pan.
Superheated steam at exit.	Fahr. 375°	Fahr. 213°	Fahr. 210°
Brine in pan.....	155°	149°	152°
Brine entering.....	198°	198°	198°
Proportions of salt obtained, per cent.....	35.96%	64.04% = 100%	

There are two or three facts in this table which may require a word of explanation. Between the exit from first and second pans there is a difference of 163° F., and 165° between No. 1 and No. 3. But in spite of this apparently much larger absorption of heat in No. 1 pan, the salt produced, and therefore the water evaporated, is only 35.96 per cent. of the whole. Practically we may assume Nos. 2 and 3 each to have performed respectively 32.02 per cent. of the duty. Now, it is clear that whatever may have been the condition, in a calorific point of view, of the exhaust steam on entering the slag chamber, it has become, by contact with the slag, true steam of a very high temperature, and besides this has become charged with latent in addition to the sensible heat it contains. It is no doubt due to this latent heat being transferred to the brine that Nos. 2 and 3 pans are enabled to perform nearly as much work as the pan which is first in the series. It will be further observed that the brine, which enters at 198°, notwithstanding its constant absorption of heat from the steam passing under the pan, falls in temperature from 40° to 50° F. This is partly due to the cooling influence due to the act of evaporation, but probably still more to the fact that the experimental apparatus had no roof, and in consequence the surface of the brine was cooled by radiation and by the wind passing over its surface.

A New York firm is constructing an electric launch for the Grand Duke Alexis of Russia.

The Center Blast Tuyere Cupola.*

BY THOMAS D. WEST, SHARPSVILLE, PA.

The economy that is possible if two or more rows of tuyeres could only be made to force the blast to the center of the cupola and at the right elevation, caused me two or three years ago to give thought to the subject and to desire to get nearer the theoretical figure than present cupolas were doing if it could be possible.

One plan after another suggested itself until the idea of a center blast came to me. Having two cupolas in our shop, I thought I would experiment with the smaller, which is 40 inches inside diameter.

The experiment in this small cupola resulted so favorably that we concluded to try the plan in our large cupola in connection with the outside tuyeres, which we did after the plan illustrated by the cut herein shown. Before starting in to use this bottom center blast tuyere, we were not safe in trying to do better than one to seven or eight in fuel, as our metal came all from pig iron and had to "come down hot." With the combination of the center blast and outside tuyeres we found we could obtain hot metal with one to ten or eleven, and I would state that the one to ten and eleven iron was often much hotter than the one to seven or eight melted with the old process, and it would often come so hot it would take considerable scrap to cool it off before it would be wise to pour the metal. To say it would be as hot as stove molders would often care to use it would probably be the best way to convey an idea of its heat, and it might be well to state that the metal would be hotter at the end than at the beginning of the heat. The cupola men liked to use the device, as it made the work of chipping out and daubing up the cupola so much easier than in the old system, for in fact there would often be very little of such work to do. In my experimenting there were several plans tried, but the one recommended later on is the best and last one I am using with this system. It cannot but be evident that with such a plan the blast is conveyed to the center of the cupola or body of fuel, where it should be to achieve the greatest results, and if the theoretical point in perfect combustion is ever to be reached it will be by some such system. Not only does this plan save fuel, but also the lining of cupolas, while the present methods or principles now used for accomplishing economy in fuel do so at a sacrifice to the lining; so much as to make it in many cases a question if there is any economy in using "upper tuyeres."

A is an outside tuyere box made of $\frac{1}{2}$ -inch wrought boiler plate, so as to make it light for dropping purpose. It is bolted only to one half or section of the "drop doors." C is a hinged cover having a hole for the bar cap supporter

D. At E is a one and one quarter hole stopped by a little pivot swinging valve, so that if through the peep hole B any leakage should be seen, this valve could be swung back to let the metal or refuse run out. It will be noticed that the tuyere box A is made of a taper, so that should slag iron or refuse drop down into it, it could be readily relieved. The cylinder at F is made of an inner and outer ring of $\frac{1}{4}$ inch boiler plate. The space G is filled with fire clay. H shows angle iron, of which there are four pieces, for the purpose of supporting the round iron rings I. These and the angle irons are for holding and preventing the bagging of the fire clay, which is daubed on over them to protect the cylinder F from the

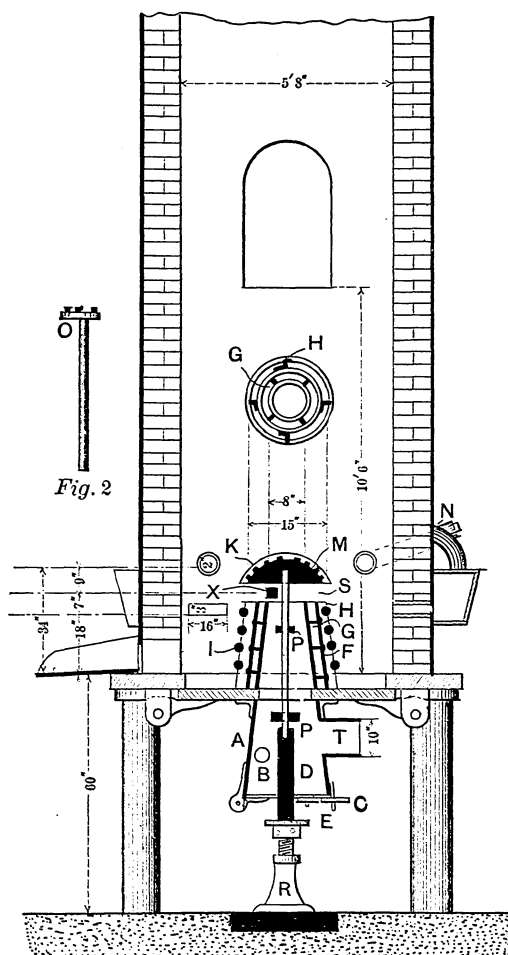
upon it and then after the blast was on and the iron commenced to melt the jack screw R would be raised, thereby lifting, of course, the bar H and the cap K to make any width of opening at S for the admittance of the blast that would be thought wise. The raising of this cap up against the pressure of coke and iron gave us trouble at one heat through breaking off of the clay at the outer rim of the cap, so that after the cast was about two thirds over the heat in the cupola had melted the casting M so as to cause a leakage down into the tuyere. We then tried another plan by letting the cap rest on three pieces of fire brick, one of which is seen at X, as done in the 40-inch cupola; these being equally divided, the blast

would have ample room to find space for entrance between the top of the cylinder F and the cap K, as at S. In order to prevent the blast from entering this tuyere ere the iron commenced melting we used a damper, as seen at Fig. 2, which would be placed up in the cylinder F at a point about level with H and which consisted of a jointed bar the same as seen at D, having at its end a round piece of $\frac{1}{2}$ -inch boiler plate, as at O, having prickers riveted into it for the purpose of holding clay to keep the damper from getting hot and also bring the clay down when the damper would be removed or the blast allowed to enter the cupola. This arrangement, of course, did not require any jack screwing. We simply had the bar D protrude below the tuyere box cover G about 2 inches, so that a swinging catch attached to this cover supported the rod D, and in removing this damper we simply knocked the catch away and the damper fell down, bringing its clay with it. Of course, with this arrangement of damper, the center supports or guides P P for the bar D, when the raising plan was used, were removed. This plan was a decided improvement over raising the cap and worked all right. The reason for it not being desirable to admit the blast through the center tuyere ere the iron commenced to melt was, in the first place, to have the bottom outside tuyeres get the carbonic acid gas well started from the lower fuel before admitting oxygen to combine with the carbon oxide created in the fuel above the bottom tuyeres, upon the same

principle that it is desirable to do so with upper outside tuyeres. In the second place, it greatly aids in preventing the tuyere hanging up when the bottom is dropped, with very large heats.

The cap K, as shown, was made larger in diameter than the cylinder F, so as to prevent the dropping metal from falling or getting into the opening at S during the heat. It will be noticed that the point of entrance for blast at S is higher than the bottom outside tuyeres. This is done to achieve the end accomplished by upper outside tuyeres in admitting oxygen to combine with the carbonic oxide in turning it to carbonic acid gas, thereby making more complete combustion.

In making connections for the blast with the center tuyere box A, conditions will vary the plan to be adopted.



THE WEST CENTER BLAST TUYERE.

melting heat of the cupola. This clay would be put on after the cylinder is placed in position inside of the cupola, and dried by the burning up of the bed. It would be the better plan to have two cylinders, so as to have one all the time on hand for drying in an oven. One heat gave us trouble through lack of care when half through by the metal getting through the clay to the iron rings. K is a clay cap having a cast iron prickered casting, as shown at M. The clay or ganister used for forming this cap K and daubing over the cylinder F should be of the best quality. The $\frac{1}{4}$ -inch bar shown at D is in two sections, so as to enable its being pulled out before "dropping the bottom."

In cases where cupolas stand high the bar might often be worked in one piece. In placing the cap K on the cylinder my first plan was to let it rest down

* From a paper read at the meeting, October 18, of the Western Foundrymen's Association.

The attachable pipe coming to this tuyere and connected at T should be an independent one coming directly from the main blast pipe, and not from any of the side tuyeres or wind boxes, and a damper should be arranged in this main side branch pipe so that the pressure of the center blast can be regulated independent of the outside blast. The cupola shown has 12 outside tuyeres, six of them being lower tuyeres 3 x 16 inches, and six of them upper tuyeres 2 inches in diameter. The width of opening for the center blast admitting of air was about 2½ inches. In "dropping the bottom" after very heavy heats we sometimes found that the center tuyere would hang up, but by a little rapping on its protruding end with bars it would come down, and leave a good "dump" or "bottom dropped cupola." In using this tuyere by itself or in combination with outside tuyeres it is essential in large heats to flux a cupola well and run the slag off. By letting slag remain in the cupola it readily chills around the tuyeres and thereby causes "banging" or "hanging up," and it might be well also to state that the outside tuyeres should be kept well open so that the blast can find easy delivery to the end of the heat through them. At the start the blast should not pass through the center tuyere with any more force than necessary to counter-balance the inside wind pressure. The blast is delivered from a No. 9 Sturtevant fan.

If this system should be adopted in cupolas that are to run steady over ten hours, like those at steel works, I would like to hear of some one trying the cylinder F (instead of as here shown), having it constructed of all fire brick, every other course being tied with a thin plate of boiler or cast iron, the edges of which standing back, so as to be protected by a covering of clay. These rings should not be over ¾-inch thickness. The idea is to make sure of the heat not causing any cracks to occur in the brick tuyere or burn the edges of the rings while the blast is on. By well tying the brick work or "breaking its courses" it might stand well without the use of the iron rings. I have tried an all fire clay cylinder tile baked in a fire brick kiln, but it did not prove a success, as it was cracked and gave us trouble from leakage. For ordinary cupola work, I know that with care and judgment the plan here illustrated, and having two cylinders as above suggested, could be made to work successfully, and all who try it will find they can save fuel and the cutting of their lining. The latter with some firms is a very costly affair. Of course, in starting in to try this system one is not expected at the very first heat to charge with a radical change in using less fuel, but gradually trying less every heat until they find by trial just how low they can get. At the start you can at least depend on reducing the bed in bulk whatever the bulk of your center tuyere may occupy, and between charges have 20 per cent. less fuel. I know that in our 68-inch cupola we reduced the bed after trials from 3000 to 2100 pounds, and in charges from 900 down to 500. The iron we place on the bed is 8000 pounds, and between charges 6000 pounds, and, as stated in first part of paper, our heats run from 50 to 70 tons. We are still experimenting in this line, but as business has been so dull for the last three months, there has been but little opportunity to go ahead and compute the results.

A remarkable coincidence in this ex-

perimenting is that after I had been laboring with the new system, thinking the idea was alone with myself, a letter came from the far North showing that another foundryman was likewise experimenting—Thomas H. Widdowson of Mankato, Minn., who wrote me on this subject after I had been at work upward of a year.

In the discussion Mr. Widdowson stated that in his experiments the melting was faster and hotter. Mr. West made the point that the use of the center tuyere allows of using a lighter blast, and added the following detail to those contained in the paper: "The cupola I used for my experiments was 44 inches in diameter and I put in upper tuyers, about four of them, about 10 inches above the lower tuyeres. I found in experimenting that when the blast was cut off you could hardly get near the charging door. The men in charging would throw their iron in and jump back. We opened the upper tuyeres and the flame would die down." Mr. Widdowson and Mr. Moore agreed that foundries usually use too much blast.

The Western Foundrymen.

The regular meeting of the Western Foundrymen's Association convened Wednesday evening, October 18, 1893, at 225 Dearborn street, Chicago, Ill., H. S. Holly in the chair. The secretary reported that in answer to about 50 letters which he had sent out to the different foundrymen, to find out what the feeling was on the question of establishing a laboratory and having a chemist, he had received letters from the following firms: The Edward P. Allis Company, Milwaukee, Wis.; Webster, Camp & Lane Machine Company, Akron, Ohio; Lane & Bodley Company, Cincinnati, Ohio; Rogers, Brown & Merwin, Chicago, Ill.; S. Obermayer & Co., Cincinnati, Ohio; Hurlbut Mfg. Company, Racine Junction, Wis.; South Milwaukee Malleable Iron Works, Milwaukee, Wis.; Walburn-Swenson Company, Chicago, Ill.; Joliet Stove Works, Joliet, Ill.

The secretary also made the following report: "At the last meeting the association also instructed the secretary to procure prices for the establishment of a laboratory and prices from chemists for taking charge of a laboratory. From informal inquiries I find it will cost \$350 to \$500 to equip a laboratory, and of course the rent of the room would be added to that, which, with the running expenses, would amount to about \$200 to \$250 a year, making a total of about \$750 a year. I have received propositions from George Ellis of Chicago, R. N. Hubbard of Columbus, Ohio, and William Molin of New York, to do the work for the association, Mr. Hubbard offering his services for \$1200 per year, Mr. Molin for \$2000, Mr. Ellis proposing a price per determination and H. O. Chute a \$1 rate, providing 25 members agree to take five determinations per month."

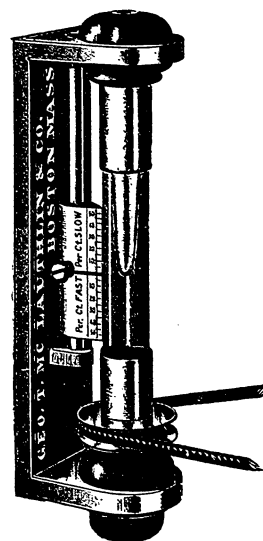
The question was debated at length by William Moore of the Joliet Stove Works, Mr. Gardner, Thomas D. West, Mr. Holly, H. O. Chute and others. It was moved and supported that the secretary be instructed to advise those from whom he had received bids that the association was not at the present time in a position to consider the matter of a common laboratory or common laboratory work.

The following applications were received for membership in the association and were unanimously elected:

Connorsville Blower Company, Connorsville, Ind.; J. H. Williams, manager Manning, Maxwell & Moore, Chicago, and the Wrought Iron Bridge Company of Canton, Ohio. A paper was then read by Thomas D. West of Sharpsville, Pa., entitled "Progress in the Science of Melting in Cupola Construction," which, with a summary of the discussion which followed, we print elsewhere.

The McLaughlin Speed Gauge.

The accompanying engraving represents in one-quarter size a speed gauge which is entirely different from the usual speed or revolution counter. It is placed in a nearly vertical position and is run at about 3000 revolutions per minute by a small cord or by light friction. It can be placed in any location where motion can be conveyed to it. The standard speed point of the index plate is set at the point of the inverted air cone, and the upper lines indicate the per cent. slower, and those below the per



Speed Gauge.

cent. faster, than standard. The glass cylinder is not quite filled with liquid. As the cylinder is revolved the liquid is thrown to the sides by centrifugal force and the bubble of air is extended down the center. At very high speed this bubble would assume the form of a perfect cylinder, and at lower speed would be cone shaped, the position of the apex or lower end of the cone being controlled directly by the speed. It is therefore evident that when properly adjusted the device will very accurately indicate the speed and will show, by the movement of the point of the cone, the slightest variations. This gauge is made by George T. McLaughlin & Co. of 120 Fulton street, Boston, Mass.

During a conference recently held between the operators and employees of a sheet rolling mill, the question of a 10 per cent. reduction in wages was being discussed. One of the workmen stated in effect that it would avail nothing if the concession was granted, as the manufacturers would immediately give the advantage to the consumer. "No, indeed," answered the manufacturer, "we cannot do that; if we do we must close our works; the consumer received that advantage long before we called you to this office to help us in our dilemma."

World's Fair Awards.

Copper and Its Alloys.

In Group 51, embracing copper and its alloys, the awards are:

Connecticut—Waterbury—Randolph & Clowes, three awards, collection of sheet copper and brass, collection of brazed brass tubes and moldings, seamless drawn copper tubes.

Massachusetts—Washburn & Moen Mfg. Company, Worcester, copper in ingots, bars and rolled alloys and products.

Maryland—Baltimore—Baltimore Copper Company, refined copper; Old Dominion Copper Company, display of copper ores.

Michigan—Calumet & Hecla Mfg. Company, Calumet, battery sands; Tamarack, Jr., Mine, Houghton County, copper bearing conglomerate.

Utah—Cactus Mining Company, Frisco, collection of copper bullion.

Grinding and Polishing Substances.

In Group 45, comprising grinding, abrading and polishing substances, the awards are:

Pennsylvania—Pittsburgh—Pittsburgh Crushed Steel Company, four awards, crushed steel, steel emery, putty powder, rouge; Tanite Company, Stroudsburg, emery, corundum tripoli, and rotten stone; the Carborundum Company, Monongahela, carborundum.

Missouri—American Tripoli Company, Carthage, Tripoli rock filter, disks and plates.

New York—Daniel Lynch, Minerva, N. Y., garnet (massive); Herman Behr & Co., New York City, flint, emery papers, pumice and rotten stone.

North Carolina—Dr. C. D. Smith, Franklin, collective exhibit of corundum.

Ohio—Ohio Grindstone Company, Cleveland, grindstones.

England—Beckmann & Co., London, emery wheels, slabs, files and hones.

Pumps, Engines and Mining Apparatus.

In Group 62, which comprises pumps, engines, and apparatus used in mining, for pumping, draining and hoisting, the following awards are made:

Illinois—Chicago—M. C. Bullock Mfg. Company, three awards, portable hoists, single and double drum, double cylinder, drums, winches and quarry hoists, Simplex gas engines; Chicago Iron works, hoisting engine for flat rope; Crane Elevator Company, two steam hoisting engines; Raymond Bros., wind motor; Fraser & Chalmers, three awards, collection of machinery and apparatus for the mining, reduction and smelting of ore, mining cage, single cylinder drum hoist, Riedler mining pump (deep); the American Well works, Aurora, sinking pump, double drum.

New York—New York City—Ingersoll Sargeant Drill Company, air head for rock drill, piston, cold air compressor; Rand Drill Company, high pressure air compressor; duplex straight line air compressors; Henry R. Worthington, four awards, Lehigh Mine pump, two central packed plunger pumps, one sinking pump, duplex plunger pump; Goulds Mfg. Company, Seneca Falls, deep mine pump.

Indiana—The P. H. & F. M. Roots Company, Counorsville, portable forges, blacksmith blowers, rotary force pump blowers, gas exhauster.

Missouri—Cookson Mfg. Company, Kansas City, Lewis patent rotary valve, duplex steam pumps.

Ohio—Lefell, James & Co., Springfield, water wheels, boiler and engines; Webster, Camp & Lane Machine Company, Akron, complete mining and hoisting machine.

Pennsylvania—Oil Well Supply Company, Pittsburgh, domeless boiler.

Scales, Weights and Measures.

For Group 112 of manufactures, including scales, balances, water meters, weights and measures, the awards are:

Illinois—Chicago—Fairbanks & Co., Standard scales, measures and weights, hopper, abattoir, suspension, packing house, stock, platform, counter, railway track, weighmasters' beams, iron dealers' bullion, cloth, prescription, postal and bank scales, paper beams, automatic night

register, general exhibit, and Fairbanks' automatic cement tester.

New York—Buffalo—Buffalo Scale Company, eight awards, combination beam for hay scales, Dormant, Columbian and Boston platform scales, fancy latch for platform scales, reverse acting meat beam, patent Boston market scales, patent testing machine. New York City—Springer Torsion Balance Company, scales and balances; Neptune Meter Company, water meters; H. R. Worthington, water, oil, molasses meters; Mogul Mfg. Company, three-spring scales; Springfield Scale Company, automatic druggists' prescription scales. Brooklyn—Thomson Meter Company, water meters; National Meter Company, water meters.

Ohio—Kirk & Bailey, Cincinnati, bicycle grindstones.

Massachusetts—Dorsey Mfg. Company, South Boston, water meters.

Pennsylvania—Metric Metal Company, Erie, spring scales; Henry Troemner, Philadelphia, counter scales.

Machinery.

Illinois—Chicago—Bishop & Babcock Company, air compressing and pumping appliances; H. W. Caldwell & Son, screw conveying machinery; Chicago Belting Company, leather belts; Chicago Raw Hide Mfg. Company, raw hide belting, raw hide rope, raw hide lacing; Chicago Fireproof Covering Company, steam pipe covering; Chapman Valve Mfg. Company, straightway valves, heavy union flanges recessed for lead, automatic indicator for sprinkler valves, fire hydrants; E. G. F. Colles & Co., upright pressure heater; Crane Elevator Company, freight elevating and hoisting machinery; Aeromotor Company, pneumatic pump; Anti-Friction Metal Company, anti-friction metal; Andrews, Johnson & Co., fan engines; William Baragwanath & Son, steam jacket feed and water heater; Crane Elevator Company, horizontal and vertical double cylinder steam reversing engines; Crane Company, brass and iron valves and cocks for steam, gas and water, special hard metal valves and engine trimmings; Crane Company, screwed and flanged fittings; Dake Engine Mfg. Company, engines adapted for direct attachments to dynamos, pumps, fans and blowers; Dodge Mfg. Company, chain oiling bearings; Dodge Mfg. Company, special dynamo pulley, wood bushing system; Excelsior Heating Company, Excelsior open feed water heater; Exhaust Ventilator Company, exhaust fans for removing hot air and steam; Fraser & Chalmers, four cylinder triple expansion condensing Corliss engine, exhibited without condenser; Goodsell Packing Company, piston rod packings for steam and other joints, sheets and rings with and without wire cloth insertion, metallic piston rod packing; Globe Light & Heat Company, machine for the manufacture of gas from gasoline for fuel and illuminating; Hawley Down Draft Furnace Company, down draft furnace; Hayes Pump & Planter Company, hand power pump; Frank Hennebohle, pressure valves; Jewell Filter Company, filter; H. W. Johns Mfg. Company, Chicago and New York, asbestos packings and coverings, vulcabeston, consisting of sheets, gaskets, rings and special forms used in connection with electrical locomotives, other machinery; I. F. Kearns & Co., pop safety valves and relief valves; W. H. Lahman, Lahman-Kirkwood shaking and dumping grate bars; Liquid Carbonic Acid Company, carbonating machinery; Link Belt Machinery Company, transmission of power by manila rope; Charles Munson Belting Company, leather belting; National Supply Company, fuel oil burner; George E. Nye, steam vacuum pumps; Olmstead & Co., drive well points; Rice & Whitacre, reversing engine; Rice & Whitacre, hot water and steam heating boilers and Kriebel engine; J. A. Roebbling's Sons Company, sheaves and cables for transmission of power; Stirling Company, water tube steam boilers; Stillwell-Bierce & Smith-Vaile, open feed water heater; Stillwell-Bierce & Smith-Vaile, live steam purifier; Charles A. Schieren, perforated leather belting; United States Car Company, shafting; Webster Mfg. Company, gas engines, rubber belt conveyors and perfected arrangement for driving pulleys by endless ropes; Cortez F. Wilson, oil tanks with pump; Warren, Webster & Co., Williams vacuum system of steam heating and Webster vacuum feed water heater and purifier; George H. Hitchcock, Danville, adjustable stuffing box; Bates Machine Company, Joliet, Bates Corliss engines; American Well Works,

Aurora, collection of pumping and well appliances.

New York—New York City—Abendroth & Root Mfg. Company, special riveted pipes; Abendroth & Root Mfg. Company, sectional water tube boiler; American Leather Link Belt Company, leather link belting; Babcock & Wilcox Company, model water tube boilers and details; Ball & Wood Company, high speed engines; Cameron Steam Pump Works, pumps; Consolidated Safety Valve Company, valves; Conover Mfg. Company, independent steam engine condenser; Lidgerwood Mfg. Company, hoisting engines for mine or contract service, bridge erection and in the operation of wire rope tramways; C. W. Hunt Company, steam engines, governors for steam hoisting engines; Ingersoll-Sargeant Drill Company, air compressor; Knowles Steam Pump Works, double acting triplex pump; New York Safety Steam Power Company, automatic cut off engine; Rider Engine Company, hot air pumps for supplying water to residences, hotels, &c.; Willman Brothers, automatic continuous "spray system" carbonating apparatus; Westinghouse, Church, Kerr & Co., upright tandem compound engines, single action high speed compound engine, collective exhibit of steam engines, steam loops; Wheeler Condenser Company, surface condensers; L. J. Wing & Co., "Wing's" disk fan; Henry R. Worthington, marine feed water heater, large check and foot valves for water works purposes, air compressor and beer racking pump; James R. Floyd & Sons, Ogden quick moving valve for gas mains, self sealing mouthpiece, valve indicator; Fuel Economizer Company, flue heater to heat feed water for boilers; John Mathews Apparatus Company, carbonating machinery; New York Belting & Packing Company, rubber belting, display of rubber packing, gaskets, balls, rolls, hose and tubing; Henry R. Worthington, horizontal triple expansion engine, four cylinder vertical triple expansion engine, vertical compound engine, underwriters' fire pumps, low duty pumps, Admiralty feed pumps, automatic feed pumps, wrecking pump, independent jet condenser and pumps, pressure pumps for mining and elevator service, ammonia pump, duplex water motor, steam accumulator combined with duplex pump, general exhibit of pumping machinery. Brooklyn—Clonbrook Steam Boiler Works, boilers; Conrad Carlson, platform and hod elevator; M. T. Davidson, compound boiler feed pumps. Buffalo—Lake Erie Engineering Works, 1000 horse-power vertical compound engine; National Meter Company, gas engines; Buffalo Steam Pump Company, steam pumps; Yawman & Erbe, Rochester, exhibit of bottle washing and rinsing machines, trucks and tanks; B. W. Payne & Sons, Elmira, improved Corliss engine; Goulds Mfg. Company, Seneca Falls, triplex power pumps for boiler feed; Electric Pipe Bending Company, Harrison, round, flat, oval and special forms of pipe coil; E. C. Fasoldt, Albany, air compressors for physicians' use; Eddy Valve Company, Waterford, straightway valves for water and steam, fire hydrants.

Massachusetts—Boston—Ashton Valve Company, pop safety valve; Hancock Inspirator Company, inspirators for feeding steam boilers; Hersey Mfg. Company, rotary pumps; A. D. Puffer & Son, bottling machinery, soda water apparatus; Tripp Metallic Packing Company, metallic packing for piston rods and valve stem; James W. Tufis, carbonating machinery; Wainwright Mfg. Company, surface condenser and feed water heaters; Walworth Mfg. Company, brass and iron valves, cocks and fittings for steam, water and gas, sections of Mills' sectional cast iron boiler. Worcester—Washburn & Moen Mfg. Co., apparatus for the transmission of power; Otis C. White, adjustable expansion movement in ball and socket joints as applied to machinery.

California—San Francisco—Golden State & Miners' Iron Works Company, steam engines; Pelton Water Wheel Company, Pelton water wheel.

Colorado—Davis-Creswell Mfg. Company, Denver, plumbers' and steam fitters' supplies.

New Hampshire—Concord—Page Belting Company, link and leather belting.

Louisiana—New Orleans—Joseph Menge, centrifugal lift pump for lifting water in huge volume; Henderson, Thoans & Gordes, absorption ice and refrigeration machine.

Maryland—Baltimore—Gandy Belting Company, stretched cotton duck belts, Zell improved water tube safety boilers.

Michigan—Battle Creek Machinery Com-

pany, Battle Creek, Marsh steam pump; Shaw Electric Crane Company, Muskegon, electric traveling crane; Union Mfg. Company, Battle Creek, steam boiler feed pumps and artesian or deep well pumps.

Minnesota—St. Paul—American Hoist & Derrick Company, contractors' machinery; James Boyd, hand and horse power hoists and elevators.

Missouri—Heine Safety Boiler Company, St. Louis, safety water tube steam boilers.

New Jersey—New Brunswick—National Iron Works Company, rocking and dumping grate; National Water Tube Boiler Company, water tube boilers and standard rocking grate bars.

Connecticut—G. H. Bushnell & Co., Thompsonville, filter presses; J. F. Case Engine Company, New Britain, 20 horse-power engine; Hay en & Derby Mfg. Company, Bridgeport, injectors; National Pipe Bending Company, New Haven, National feed water heater; Yale & Towne Mfg. Company, Stamford, differential pulley blocks, screw blocks, safety double lifts, pillar cranes, safety hoisting winches, crabs, sustaining tripods, electric traveling crane.

Indiana—Anthony H. Bryan, Evansville, automatic hot and cold water elevator and distributor; Flint & Walling Mfg. Company, Kendallville, pumps; Reeves Pulley Company, Columbus, wood split pulleys; South Bend Pulley Company, South Bend, wood split pulley.

Iowa—Red Jacket Mfg. Company, Davenport, force pump; Sioux City Engine Works, Sioux City, Sioux City Corliss engine.

Ohio—Cincinnati—J. H. McGowan & Co., general exhibits of pumps, &c., back pressure valves, gate valves, sprinklers, hydraulic tobacco machine; William Powell & Co., eight feed lubricators and engine grinding valves; Laidlaw & Duun Company, pumping machinery.

Buckeye Iron & Brass Works, Dayton, high pressure improved hydraulic power pump, brass valves and fittings, iron body valves; Cleveland Faucet Company, Cleveland, pumps; Deming Co., Salem, rotary and other pumps, hand piston pumps, hydraulic rams, well digging tools, hydraulic pumping motors; Hoppes Mfg. Company, Springfield, live steam feed water purifier, exhaust feed water heater; Falls Rivet & Machine Company, Cuyahoga Falls, ring oil bearings, friction clutch, couplings for driving pulleys; Jeffery Mfg. Company, Columbus, chain elevators; Morgan Engineering Company, Alliance, steam hammer, overhead traveling crane; Brass & Iron Works Company, Fostoria, gate valves, pipe fittings; Buckeye Engine Company, Salem, simple engines, medium speed, high speed, tandem compound, cross compound condensing, triple expansion four cylinder condensing engines, exhibit of an engine cut away through cylinder, steam chest and valves; Norwalk Iron Works Company, South Norwalk, air compressors; Vulcan Brass Company, Cleveland, hydraulic and hand pressure beer pumps and faucets.

Pennsylvania—Philadelphia—Alexander Bros., leather belting; Hugo Bilgram, smooth running glass; Otto Gas Engine Works, Otto gas engine and gasoline engine; L. Schulte & Co., injectors, steam jet system pumps, jet pump, artesian well system pumps, hydraulic valves, steam trap, automatic eductor and plain eductor, exhaust steam induction condenser; William Sellers & Co., electric traveling crane injectors, Rick bottle cleansing machine, bottle washing and rinsing machine in combined operation; R. D. Wood & Co., Philadelphia, Camden valve and turbine wheel. Pittsburgh—Oil Well Supply Company, Mogul stationary engines, exhibit of brass and iron valves and fitting for Klein & Lays patent pipe line tongs; Phoenix Iron Works Company, Meadville, Dick & Church tandem compound engine. Erie—Jarecki Mfg. Company, Limited, exhibit of brass goods and iron fittings; Stearns Mfg. Company, automatic high speed engine, Gill water tube boilers; Z. A. Watson, Excelsior boiler feeder; Ball Engine Company, 500 horse-power cross high speed compound condensing engine; Bethlehem Iron Company, South Bethlehem, propeller shafts and model of 125-ton steam hammer; A. B. Farquhar Company, Limited, York, 75 horse-power Corliss engine. Waynesboro—Frick & Co., ice making and refrigerating machinery, portable boiler and steam engine. Harrisburg—Harrisburg Foundry & Machine Company, Ideal tandem compound engine; Keasby & Mattison Company, Ambler, pipe covering; J. H. McEwan Mfg. Company, Ridgeway, tandem compound steam engine; Boyts, Porter &

Co., Connellsville, single direct acting steam pump; Cyrus Chambers, Jr., Overbrook, model of steam engine made of silver and gold; Downie Pump Company, Valencia, artesian well pumps.

Rhode Island—Providence, Mason, Volney & Co., hoisting machinery, friction clutches; Providence Steam Engine Company, compound steam engine.

Vermont—Montpelier, L. P. & D. Transmitter Company, system of transmitting power.

Virginia—Cardwell Machine Company, Richmond, exhibit of pumps.

West Virginia—Charles Ward, Charleston, water tube marine boilers.

Wisconsin—William Wenzel, Appleton, Converse centrifugal pumps; Williams Engine & Clutch Works, Beloit, friction pulley; Otto Zwietch, Milwaukee, carbonating and bottling machinery, seamless portable steel fountains.

In Group 50, comprising aluminum and its alloys:

Joseph M. Hirsch, Chicago, electroplating of aluminum upon iron, zinc, copper, wood; Deutsch Oesterrich Mannes Rhoer, Berlin, Germany, seamless Mannesmann pipes of aluminum.

Boring and Drilling Tools, &c.

In Group 61, for boring and drilling tools and apparatus for breaking ore and coal, the following awards were announced:

Illinois—Chicago—Eugene Moreau, rock drilling tools; M. C. Bullock Mfg. Company, drills, drilling machinery, Gadder heading machine, Stine-Smith mining machine, Mitchell long wall machine, rock drills; F. C. Austin Mfg. Company, portable rock drilling machine, steel jetting well; Sullivan Machine Company, swivel head channel, drilling machinery; American Well Works, Aurora, well boring, jetting and drilling machine, well auger; Peoria Coal Drill Works, Peoria, coal cutting and mining machine.

Ohio—Beal's Mining Core Drill Company, Elyria, core drills and tools; Star Drilling Machine Company, Akron, drilling machines; Jeffrey Mfg. Company, Columbus, electric coal mining machines, electric rotary coal drill and ironclad motor, air power rotary coal drills.

New York—John Suydam, Albany, metal flexible joint; Rand Drill Company, New York, rock drills and Derby bit; The Rogers Sargeant Drill Company, New York, adjustable tunnel column, clamp and crescent, battery; Ingersoll-Sargeant Drill Company, New York, drills and coal mining machines.

Iowa—Morgan, Kelly & Taneyhill, Waterloo, well-drilling machinery.

Pennsylvania—Oil Well Supply Company, Pittsburgh, well drilling tools, machinery and apparatus, working models, and drilling rigs.

Munitions of War, &c.

In the Department of Manufactures, Group 113, the following awards were announced for munitions of war, weapons, &c.:

Connecticut—Winchester Repeating Arms Company, New Haven, four awards, for small arms, military, sporting and hunting fire arms, ammunition, cartridge reloading implements; Ideal Mfg. Company, New Haven, four awards for implements for reloading cartridges, shells for rifles, pistols and shot guns, powder flasks, bullet molds; Bridgeport Gun Implement Company, Bridgeport, three awards for gun implements, Foster auger bits, loading machinery of all kinds; Parker Bros., Meriden, breech loading shotguns; Colt's Fire Arms Mfg. Company, Hartford, firearms; Union Metallic Cartridge Company, Bridgeport, metallic ammunition; the Marlin Firearms Company, New Haven, sporting and hunting firearms.

New York—Burgess Gun Company, Buffalo, N. Y., sporting and hunting firearms; Francis Baumerman, New York, two awards for repeating shotguns and rifles and riot guns; Lefever Arms Company, Syracuse, N. Y., automatic hammerless guns; Remington Arms Company, Ilion, N. Y., military and sporting firearms.

Smith & Wesson, Springfield, Mass., revolvers.

Louis Jordan, Chicago, Ill., sporting and hunting guns, hand made.

Illinois—Chicago—American Screw Company, heading machine, threading machine; Vulcan Iron Works, drop hammers and pile

caps; Charles H. Besley & Co., oil cups; Crane Company, pipe tools; Capitol Mfg. Company, Adams automatic bolt threading machine, Cook universal die adjusting automatic bolt threading machine, Capitol combination pipe and rod threading and cutting off machine, Cook full automatic nut tapping machine; Canedy Otto Mfg. Company, blowers and forges, drills, screw plates, pincers and clamps; Farquhar Heating Company, hand riveting machine; International Steel Post Company, machine for making metallic fence posts; A. J. Oehring, multiple drilling machine; John E. Walsh, gasoline torches for soldering and brazing; Yankee Machine Works, twist drill grinder for drill grinders; W. F. & John Barnes Company, Rockford, drilling machines and iron and wood working machinery.

New York—Brooklyn—E. W. Bliss & Co., power presses, seaming machines and gang slitters; J. H. Williams & Co., forgings and wrenches; Stiles & Parker Press Company, punching presses and drop hammers; Merrill Bros., drop hammers; Capital Machine Tool Company, Auburn, quick-acting vises; Gleason Tool Company, Rochester, Gleason engine lathes. Buffalo—Keystone Mfg. Company, patent nonpareil wrenches; Niagara Stamping & Tool Company, machine tools. Manning, Maxwell & Moore, New York, machine tools and machines for working metals; D. Saunders Sons, Yonkers, machines for cutting and threading pipe; Westcott Chuck Company, Oneida, scroll and drill chucks.

Ohio—Cleveland—Bardon & Oliver, Monitor lathe for brass work; Cleveland Twist Drill Company, machine tools; Acme Machinery Company, threading machines; Standard Tool Company, exhibit of twist drills, fluted drills, reamers, drill sockets, arbors, mandrels, taps, milling cutters, chucks, gauges, screw driver bits; Van Wagner & Williams Company, wrought steel vises; Warner & Swasey, machine tools and process for arranging and cutting the teeth of spur wheels.

Hamilton—Niles Tool Works Company, turret head screw machine, exhibit of iron working tools, heavy machine tools; Long & Allstatter Company, boiler sheet and horizontal punching machine, multiple punching machine, angle iron punching machine. Dayton—Buckeye Iron & Brass Works, power feed turret forming lathe, automatic hexagon milling machine; National Machinery Company, Tiffin, bolt cutting, heading and tapping machines; Lodge & Davis Machine Tool Company, Cincinnati, machine tools; Christy Knife Company, Tremont, machines for manufacturing knives; Brass & Iron Works Company, Fostoria, tapping machine; Wells Machine Works, Toledo, combined arrangement for threading and cutting pipes.

Pennsylvania—A. Falkenau, Philadelphia, machine tools, power tool grinder; Jarecki Mfg. Company, Erie, pipe cutting machinery combined with engine; Newton Machine Works, Philadelphia, cold sawing machine; R. D. Wood & Co., Philadelphia, hydraulic machinery, shearing, punching and riveting machinery, lifting apparatus for riveting.

Connecticut—Hartford—Billings & Spencer Company, machinists' tools and drop forgings, box opener; Pratt & Whitney Company, collection of machine tools, standard measuring machines and standard gauges, miscellaneous small tools for machinists' use; A. D. Quint, turret drill. Southington—Peck, Stow & Wilcox Company, tin-smith tools, bench tools, meat cutter, and machine for cutting and folding tin. Bridgeport—Armstrong Mfg. Company, pipe threading machinery; Curtis & Curtis, thread machine, die stock; Hendy Machine Company, Torrington, planers, engine lathes, pillar shapers; E. Horton & Sons Company, Windsor Locks, chucks; Charles Parker Company, Meriden, machinists' vises.

Delaware—Wilmington—Hilles & Jones Company, shears and punches, No. 4 plate planing machine and No. 4 vertical milling machine.

Massachusetts—Boston—American Tool Company, brass finishing lathe and oil separator; George H. Eaton & Co., power presses; Walworth Mfg. Company, machine for tapping street main under pressure. Hyde Park—Brainard Milling Machine Company, No. 12 and 14 tool room milling machine, No. 1, 3, 4, standard universal milling machine, upright plain milling machine, horizontal plain milling machine, long feed milling machine, can cutting machine, small milling cutter grinder, gear cutting machine; Hurlbut, Rogers Machine Company, South Sudbury,

cutting off and centering machines; Morse Twist Drill Machine Company, New Bedford, twist drills, taps and dies, milling cutters, reamers and chucks; Prentice Bros., Worcester, screw cutting engine lathes and upright drilling machines; John Stark, Waltham, lathes.

Colorado—Wiswall & Davis, Longmont, automatic blacksmith foot hammer.

Maryland—Detrick & Harvey, Baltimore, open side planers.

Michigan—Fox Machine Company, Grand Rapids, shapers; Leland, Falconer & Norton Company, Detroit, double grinders with patented watering devices; Morton Mfg. Company, Mnskegon Heights, key way cutters.

New Hampshire—Nashua—Flathers & Co., screw machine, screw cutting engine lathes, planing machine and hand reaming machines.

Refrigerators and Hollow Ware.

Illinois—Chicago—Wickes Refrigerator Company, tile lined refrigerator room; Vienna Enamel Stamping Company, three awards, enameled steel ware, kitchen utensils, wainscotings; Belding Mfg. Company, household, grocers' and butchers' refrigerators; Paul Dalmicks, four awards, butchers' supplies, ice box, counter, block, meat sack; G. M. Shirk Mfg. Company, refrigerators, cabinets; Adams & Westlake, cans; D. R. Sperry & Co., Batavia, four awards, kettles, farm boilers, caldrons, drug mortars.

Indiana—Summit Refrigerator Company, Michigan City, refrigerators and sideboard refrigerators; Fred A. Wilke, Richmond, portable china kilns for firing decorated china and glass.

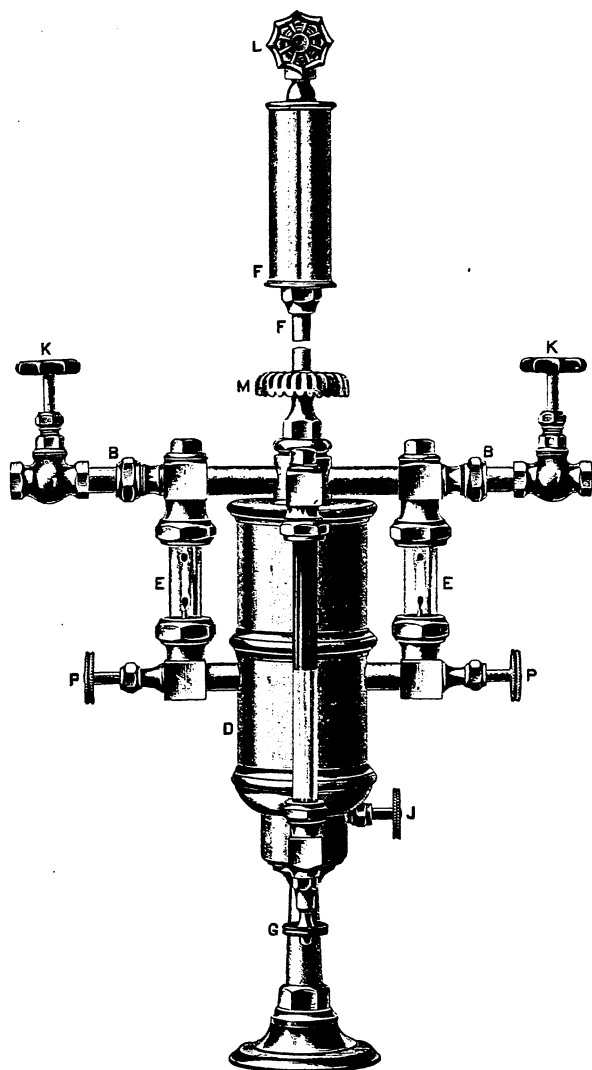
Ohio—Wagner Mfg. Company, Sidney, nickel plated cast iron ware.

Massachusetts—Boston—A. D. Puffer & Sons, soda water apparatus and all appliances; Smith & Anthony Stove Company, kettles; James W. Tufts, Chelsea, soda water apparatus and appurtenances; the Low Art Tile Company, art tile soda fountain, soda fountains; Paul J. Daemicke, Butcher Boy cooling room; Wolf, Sayer & Heller, butcher cooler; National Key Opening Can Company, key opening can.

Minnesota—The Hurd Mfg. Company, Duluth, refrigerators.

New York—Northern Refrigerator Company, refrigerators and all fixings; Iron Clad Mfg. Company, tinned, galvanized and enameled household or kitchenware, steel soda fountains, rotary ash sifters, utensils, cold handles, soda fountains, enameled sheet metal ware.

Maryland—Keen & Hagerty, Baltimore, tinned, stamped and japanned ware.



THE SEIBERT DOUBLE SIGHT FEED LUBRICATOR.

The Seibert Double Sight Feed Lubricator.

This lubricator, made by the Seibert Cylinder Oil Cup Company of 53 Oliver street, Boston, Mass., is interded for compound and other engines, and is made with special reference to the use of heavy oils. It is furnished with short, large sight feed glasses, and a long glass in front for showing the height of oil in reservoir or oil cup. At the bottom of the sight feed glasses there are valves, P P, placed to shut off the oil feed in case the glass gets broken. The condensing pipe A and the discharge pipe B being connected with the steam pipe C, the pressure in both pipes is equal, but the steam entering pipe A condenses and fills pipe F with water, and the weight of this column of water causes the oil in the reservoir D to pass out through pipe B, and thus into the steam pipe, as fast as the water from pipe F is fed into the reservoir by valve J. The oil forced from the reservoir passes down through a tube from the top of the reservoir to the bottom of the sight feed glass, and is there discharged into the water with which the glass is filled, and can be seen as it passes to the cylinder, rising drop by drop through the water. The quantity of oil being used is thus seen at a glance and the feed regulated. The oil is fed in just the quantity needed continuously, and passing into the steam pipe vaporizes and lubricates all of the internal parts of the engine.

The Philadelphia Warehouse Company report a falling off in their business with the iron trade, owing to the general depression and the curtailment of production. A leading feature of their business has been the storing or warehousing of iron, either in the pig or manufactured, as collateral for advances made by them. Under their plans storage is provided in any section at cost price, so that holders may have the advantage of pecuniary assistance with cheap storage, on a margin which will not advance the price of the material to an unreasonable extent.

A steamship of a new type arrived in the port of Philadelphia a few days ago from England. She is the British steamer "Mexican Prince," built at Wallaseid, England, and arranged on a convertible principle, whereby the vessel is enabled to carry general or liquid cargoes at very short notice. She has every requisite for loading and discharging any class of products that would ever require conveyance across the sea.

New Jersey—Trenton—Clark, Fisher & Co., anvils, vises, and anvils and vises combined; Ferracute Machine Company, Bridgeton, cutting presses. Newark—Chas. Sloan & Co., small bench lathes and attachments; Gould & Eberhardt, combination drill and tapping press; new type gear cutter. Plainfield—Pond Machine Tool Company, lathes and boring machines, 42-inch car wheel or tire lathe for turning tires on their own axles, planers.

Rhode Island—Providence—Beaman & Smith, heavy standard milling machine, No. 2 standard drilling and boring machine, No. 1 horizontal spindle drilling and boring machine; Brown & Sharpe Mfg. Company, universal milling machine, exhibit of machine tools, universal grinding machine; Darling, Brown & Skarpe, tools for accurate measurement; J. M. Carpenter Tap & Die Company, Pawtucket, taps and dies.

Wisconsin—Gisholt Machine Company, Madison, turret lathes, tool grinding machines, machine tools.

Connecticut—Chapman Mfg. Company, Meriden, four awards, hardware specialties, silver, gold and nickel tea bells, sleigh and telephone bells, dog collars.

Wisconsin—Otto Zuietuschke, Milwaukee, onyx and marble soda water fountain, sundry supplies; Wisconsin Refrigerator Company, Eau Claire, refrigerators and sideboard refrigerators; Jacob J. Volhath Mfg. Company, Sheboygan, enameled cast iron ware and sheet iron ware.

Michigan—Grand Rapids—Grand Rapids Refrigerator Company, refrigerators, sideboard refrigerators; John Matthews Company, refrigerators; Alaska Refrigerator Company, Muskegon, three awards, refrigerators, ice chests, beer cooler; E. T. Barnum, Detroit, vases; Mrs. M. M. Harris, Detroit, refrigerator, the "M. M. Harris." Pennsylvania—Griswold Mfg. Company, Erie, five awards, cast iron hollow ware, store furniture, house furnishing goods, cuspidors, post boxes; Charles Lippincott & Co., Philadelphia, soda water apparatus.

Anti-Friction Ball Bearings.*

BY GEORGE F. SIMONDS.

The fundamental principle on which balls are now used in bicycles is not correct. In the present style of bearing:

1. The balls are loose and must be handled singly.
2. Each ball is required to sustain both the weight and end thrust.
3. But two rows of balls can be used, one row at each end of the bearing.
4. On account of the principle on which it is constructed the balls and bearing surfaces wear away.
5. There must be a means of adjustment on account of this wear.

In the double cage bearing these conditions are reversed. The balls are confined in cages, and readily and safely handled; one set of balls carries the weight, while another set takes the end thrust; any required number of balls can be utilized; properly made, there is practically no wear, and as there is no wear of the parts no adjustment is necessary.

The statement that there is practically no wear to a ball bearing when designed and constructed on the correct principle will undoubtedly be questioned, but as long use shows no change in the measurement of the size of the balls and bearing surfaces, and as the oil with which they are lubricated is not materially discolored, the claim would seem to be justified.

The bevel cage bearing was originated to take the place of the present style of bearing for light work only, for utility and for economy in construction. It is superior to the present style of bearing, in that the balls are carried in cages, and that they run on plane bevel surfaces in place of grooved bevel surfaces. The bevel cage bearing will come into use where the work is very light and where the greatest economy in construction is necessary. The double cage bearing will be generally adopted in those classes of vehicles and machinery where the best is wanted, and economy in use and permanency are in demand.

In subsequent remarks on the bearings themselves reference is made to the double cage bearings only; in the manufacture of the bearings, to double and single cage bearings.

The shafting and parts of the machinery in a small manufactory were started on these bearings in August, 1891, and have been in constant use since. Several carriages have been mounted on them, and a brougham so constructed has been on the streets of this city for the past 30 days. A street car constructed with bearings with $\frac{3}{8}$ -inch balls, after constant use for five months, 16 hours per day, showed no wear whatever. Balls that were applied between plane surfaces under heavy pressure measured the same at the end of four years as when first put at work. Several bicycles, ridden constantly for two seasons, developed marked superiority over the old construction. Many instances can be cited showing the practicability and value of the bearings.

When the proper principles for the bearings had been discovered, and the designs perfected, but a beginning had been made looking to their general introduction. A ball bearing, to be of lasting commercial value, must be absolutely accurate and reliable. Perfect spheres were indispensable, and they

had never been commercially produced, and the balls and bearing surfaces were required to be of a temper always uniform and reliable, and by no known processes could these results be attained. A small shop was erected in which a force of skilled men have been employed for the past 20 months, and steel balls are now made of absolute sphericity, alike one with another, and with great economy, and a system has been developed for making tempered articles uniform in quality, with a great saving in cost over existing methods for doing similar work. The accuracy and efficiency of the new system of making spheres will be appreciated when it is stated that balls $\frac{1}{8}$, $\frac{3}{16}$ and $\frac{1}{4}$ inch in diameter have been ground from pieces of steel, cylindrical in form, so that they do not vary $\frac{1}{10000}$ inch from perfect spheres or from each other in size.

As the patents covering these various processes and devices are not yet all issued, detailed descriptions must in some cases be withheld, but enough can be made known to convey a general idea.

The new system for making tempered articles is covered by a series of patents under the following titles:

The metallurgical furnace.

The tempering oven.

The double bath hardening process.

The process for hardening rings and sleeves.

By this system Bessemer or open hearth steel is used, carrying about ten points of carbon and costing from 2 to 3 cents per pound, in place of machinery or tool steel, carrying from 30 to 150 points of carbon, and costing from 6 to 16 cents per pound.

By the ordinary hardening process, the quick cooling of a tool made of high carbon steel throughout causes warping and breaking, and has been a source of untold trouble to workers of steel for all time. It is customary in hardening, when the tool needs to be very hard, to cool the article in water or brine, which cools quickly; this secures the desired hardness, but the sudden cooling sets up unequal strains throughout the article, causing the warping and breaking. When extreme hardness is not required, or when an article cannot safely be dipped in brine, it is cooled in a slow cooling medium, like oil. This hardens to some extent and makes the article tough and with less liability to fracture.

To largely overcome these difficulties the double bath hardening process was devised, by means of which the article is plunged into brine and instantly transferred into oil without coming in contact with the air. By means of this device, which I now use for hardening all articles, all the advantages are gotten of both the quick and slow cooling processes now in use, and with much less liability of fracture, and in many cases it is not necessary to afterward draw the temper.

There have always been more or less articles made from iron or steel of low carbon and treated to the process known as case hardening. This process, as heretofore practiced, has made the surface, as a rule, hard for only a slight depth; to use the expression as generally applied in this connection, "skin deep." Greater depth than this is at times secured, but with no certainty of results. By means of the furnace to which I now refer, the ancient and well known cementation, case hardening process is brought under complete control.

All have become familiar with the

Harvey process, as applied to armor plate. Great depth of high carbon is secured by that process in the surface of low carbon steel, by subjecting the same, while buried in carbonaceous material, to a high heat, beyond the melting point of cast iron. My furnace was designed and constructed with the view of adopting that process in making the bearing surfaces of these ball bearings, but on testing it I found that the high heat necessary by the process raised the grain of the steel so that it was not adapted for these purposes. The high heat also, as it proved, would destroy the efficiency of my furnace, and I decided to use tool steel for the bearing surfaces and the workmen were instructed to use the furnace for annealing and case-hardening purposes. Later developments, using the ordinary process of case hardening with the article packed in carbonaceous material in a cast iron box, demonstrated that the furnace would accomplish, at a low heat, what had before only been possible to do at a high heat.

By means of this furnace, for the past 18 months all the bearing surfaces for these ball bearings have been made from ten carbon Bessemer steel, and also all the reamers, taps, gauges, &c., which have been needed in their construction, as well as a large variety of articles for other purposes.

Having secured, through analysis, the exact result of each day's work, it has been demonstrated that formulae may be established, and by set rules definite and inflexible results will be obtained. The surface of any article can be carburized to any given required depth, and to any high degree of carbon, at a low heat, and in a limited time, without impairing the cutting or wearing qualities of the steel. The furnace is operated at a very moderate expense for fuel, and has needed no repairs in 18 months of constant use. During that time no article has been cracked or broken through the processes.

By means of the new process for hardening rings and sleeves any number of tubular pieces can be hardened with absolute precision alike one with another. This is especially valuable in the manufacture of the ball bearings, but will in time come into general use for all purposes to which it is adapted.

The tempering oven is quite new, and will give a uniform heat for drawing the temper, which, so far as I am aware, is not at present attainable.

These ball bearings have been subjected to an exhaustive test to determine the saving in power and their wearing qualities. This test demonstrated that the friction is less than one-thirtieth of that developed by the best class of ordinary bearings as now in use. The rotating shaft of the testing machine—a machine designed and made especially for the purpose—was 2 $\frac{1}{2}$ inches in diameter, and the balls as used in the bearings were $\frac{1}{4}$ inch in diameter. The first series of tests demonstrated that the maximum speed attainable with the best ordinary bearings, under 200 pounds pressure, was 1000 revolutions per minute, owing to excessive heating of the journals and boxes. A ball bearing mounted on the same shaft at 1000 revolutions under a pressure of 2800 pounds did not heat at all.

In the second series of tests ball bearings were introduced in the machine where the ordinary bearing in the first test had been used. The velocity of the shaft was then increased to 2600 revolutions per minute, and it was demonstrated that increase of pressure on the bearings did not perceptibly in-

* From a paper read before the Franklin Institute of Philadelphia.

crease the resistance (or friction), and with an increase in the velocity the resistance was so slight as to be of no material importance.

A test of the resisting power of steel balls was made. Three $\frac{3}{4}$ -inch balls stood a direct pressure of 175,000 pounds, or 58,000 pounds per ball, without injury. The same size balls

The Morse Valve Reseating Machine.

The Leavitt Machine Company of Orange, Mass., make the valve reseating outfit shown in Fig. 1, which is used to reseal all flat and taper seated valves from 4 to 9 inches, while that shown in Fig. 2 takes the range of 9 to 12 inches. The

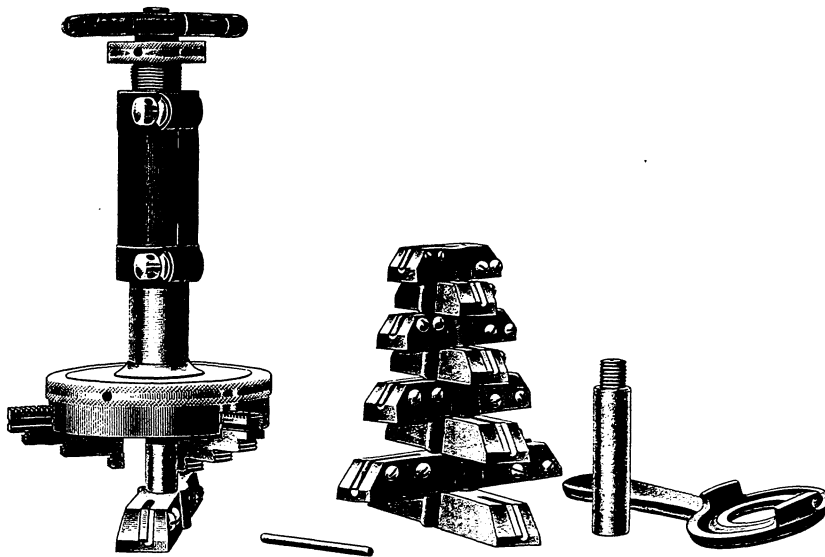


Fig. 1.

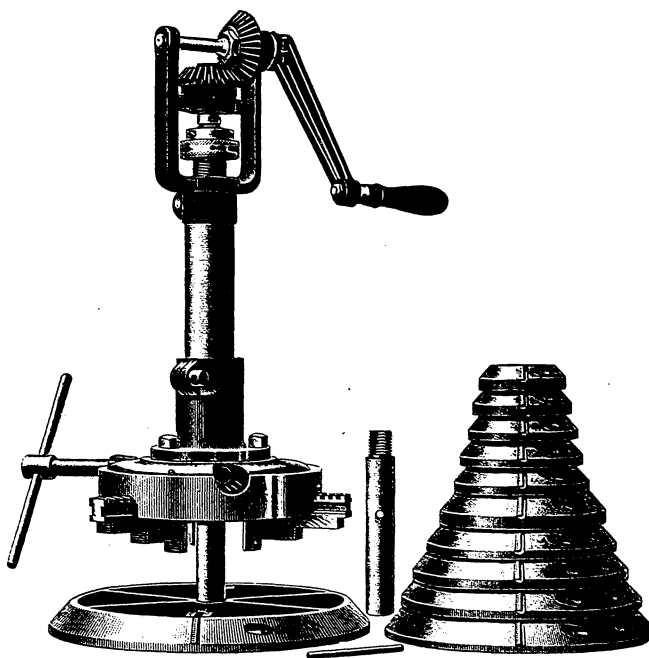


Fig. 2.

THE MORSE VALVE RESEATING MACHINE.

were rotated between parallel plane surfaces, and under these conditions the balls and the bearing surfaces (the latter Bessemer steel, case hardened) successfully withstood a pressure of 2500 pounds per ball.

The New Orleans *Picayune* says the amount of cotton crop of 1893 actually in sight in the South is practically the same as the amount in sight at this time last year. Popular estimates run from 7,250,000 to 7,500,000 bales.

lower portion of the machine is provided with a chuck arranged to grip in the opening in the body of the valve and thus hold the device firmly in position. The lower end of the spindle carries the cutter, which is fed to the work by means of a screw having a knurled top, as shown in both engravings. The sleeve carrying the spindle can be clamped in any desired position in the chuck. The machine represented in Fig. 1 is operated by means of a hand wheel, the other being operated by a crank and beveled gears.

Canadian Notes.

Trade and industry have been normally active and nothing has happened to throw either out of its usual grooves. Though the rate of interest has been high—seldom below 7 per cent. since last spring—and though lenders have been very exacting as to the character and amount of security proffered, the circulation has been above the average. In August it was greater than it has been for some years. In September it was almost equal to the very large circulation in that month last year. Mercantile and productive operations have, therefore, not lacked necessary financial sustenance, and both have been larger in volume than they were last summer when less was heard about hard times. Confidence was never absent at any time. Bankers and manufacturers believed that crops would be full, and that everybody's purchasing power would be improved this fall. They therefore co-operated to launch a considerable volume of business upon current credit. The amount and promptness of returns that have matured show that they were right. Harvest machinery, agricultural implements, wire, nails, stoves, furnaces, manufacturing plants, bridge works and sundry other products of iron have figured prominently in the season's exchanges. There have been no failures of any moment in this group of manufactures.

Some hope is entertained that one result of the revision of the United States tariff will be the admission of iron ore free of duty. This hope is cherished both by owners of mining lands of easy access to American consuming importers and by domestic consumers of pig iron. The former of course want a market for their ore, of which there is believed to be an abundance superior in quality and economically available for smelting in the Eastern States and along the border. The iron ore wealth of central Ontario, of Nova Scotia, of Algoma and probably of British Columbia might be considerably developed by a free market in the United States. The establishment of smelting works at various points in this country would be but a partial stimulus to mining enterprise, as, unless we had a large export demand to produce pig iron for, we should be unable to use the product of any great depositories of ore. The consumers of pig iron in this country would be satisfied with the free admission of ore to the United States, as that would be certain to bring down very considerably the price of pig iron, nearly all of their importations of which come from the United States. The abolition of the American duty on iron ore would be felt beneficially in this country in the lower prices at which nearly every article of iron composition could be obtained. Of course our smelters would not hail with approval the free admission of ore to the United States, as such a step would have no influence to cheapen their cost of production, while it would probably raise the price of their material and would certainly lower the price of their product. Since the talk of free iron ore in the United States less has been heard of the numerous proposals to start smelting works at various points.

As the time of year approaches when Parliament assembles there is perceptible a revival of interest in some of the questions left unsettled last session. The Premier and several of his colleagues in government have been touring the country again and holding political

meetings, at all of which promises of a revision of the tariff are made. The manufacturers who use pig iron, bar iron, sheet and hoop iron are ready again to push forward their claims for a reduction of the duty. Last winter a very thorough investigation of the question of protection in its effects upon manufacturers whose material was heavily protected was made by a committee of the Toronto Board of Trade. Their case, however, did not come up for consideration before the Budget, with its meager changes, was brought down. They are still urgent for free or but moderately protected material. The farmers of the Northwest are more stubbornly than ever possessed of the idea that their farm implements and machinery should not be subject to so heavy a tax for the benefit of home manufacturers. They still hold out, also, for free binding twine, fence wire and coal oil. The low prices they have had to take for the last two crops of their wheat disposes them to be very steadfast in their support of an attack upon protection. It is improbable, however, that any amendments made in the tariff will materially modify its protective character.

The various associations of iron manufacturers held their quarterly meetings in Montreal last week. The manufacturers of bar iron, cut nails, wire, wire nails, horseshoes, horse nails, bolts, &c., made no changes of moment in prices or terms. But the seam dividing the Eastern from the Central and Western members of the associations has finally opened out and parted the two sections. The manufacturers of St. John, N. B., and Halifax, N. S., have for some time been accused of selling at prices different from those adopted by the association. The former were not at the Montreal meetings, and it has been resolved to consider them no longer in the association, and to meet them at their own prices in their own territory. Heretofore, the arrangements between the two sections has been of the nature of a partition treaty, the East being given up to the maritime province people, and the West to the manufacturers of Montreal, Toronto and Hamilton. The prices quoted in the East precluded Western manufacturers from obtaining their schedule rates there after paying freight. The adjustment of Easterners' prices similarly prevented them from shipping to the West. The Association of Manufacturers of Bar Iron, Nails, &c., is holding well together so far as Montreal and the West are concerned. There were several tentative efforts made, however, before they got a well knit organization. Three years ago a ruinous competition in nails and bar iron brought them together again into an agreement that was both literally and metaphorically a wrought iron agreement.

The Ferrona Iron Works, in Ferrona, N. S., have been in operation about a year. Considerable quantities of their pig iron have been distributed in the West, and the industry appears to be a thriving one.

The machinery for the new iron and steel works at Hamilton has been contracted for. The syndicate has applied for incorporation under the style of the Hamilton Iron & Steel Company. Capital, \$1,000,000.

The Central Bridge & Engineering Works, Peterborough, Ont., have a contract for a number of large flexible joints for the water pipes in the Buffalo Water Works. The inside diameter of

these joints is 5½ feet, said to be the second largest in the world.

Arendt Angstrom, late naval architect and constructing engineer for the Cleveland Shipbuilding Company, has accepted the position of general manager in the Doty Engine Works, Toronto.

The William Clendinneng Company, Montreal, have been incorporated to take over the business of Wm. Clendinneng & Sons, manufacturers of stoves, ranges, iron pipes, castings, &c.

The array of products of iron and steel manufacture at the Industrial Exhibition at Toronto this year was very large. There was little that was very distinctively new, however.

A cause of some dullness in the seasonable trade in heavy hardware is the comparative backwardness of the lumber industry this year. Last fall and winter operations were very extensive in the lumber regions. The sales to American buyers were larger than they had been for many years. This was due to the lowering of the United States tariff on lumber by the McKinley act. But while our shipments of lumber were large, payments were not so prompt as they used to be. The stringency across the line was severely felt by all connected with our lumber interests on this side. But more than delayed payments and the troubles incident to delay followed. American buyers seem not to have recovered their old financial energy for the autumn business, and lumber prospects here are dull. The hardware trade misses the demand for camp equipments, for saws, axes, cant hooks, crowbars, chains, bolts, &c. Manufacturers of sleighs also report a falling off this fall.

The fine, open fall has made trade brisker than usual in hunters' goods. General lines of firearms of United States manufacture are prominent in stocks.

A factory for the making of a new style of lawn mowers is to be started in Brantford by the former president of the Harris Company, lately amalgamated in the Massie-Harris Company.

The contract for supplying steel rails on Government railways was divided up this year. J. R. Hutchins of Montreal has an order to supply 2500 tons; Charles Cassils of the same city is to furnish a like quantity, both for the Intercolonial Railway. W. H. Daunt is awarded the contract to supply 1000 tons for the P. E. I. Railway and 300 tons for the Windsor branch.

The contract for building the five pairs of lock gates at the Sault Canal has been awarded to an Ontario firm. The engineering estimate of the cost is \$80,000.

The facilities for improvement afforded by the evening educational classes of the Young Men's Institute, 222 Bowery, New York, are being increasingly appreciated by young mechanics of the city. The classes this season have a larger enrollment than in any previous year in the history of the institution. Nearly 300 young men, who are working at various trades in the day time, employ their evenings in acquiring mental and technical knowledge, of whom 40 are taking the course in steam engineering, 35 that in electricity and 40 in bookkeeping.

A revival of Mississippi River trade is predicted.

Trade Publications.

PARSONS' MANGANESE BRONZE has been used by the home company of London in over 1200 blades and propellers, and no breakage has occurred in seven years. Its extended use by the prominent steamship lines has proved it to possess all the most essential qualities needed in a propeller blade. One of the peculiarities of this bronze was shown when the "City of Paris" was in dock. One of the blades of her screw fell and the outer portion was doubled up into a U-shape without showing the least sign of a crack. When the steamship "Eider" was on the rocks her engines were driven and yet the damage to the propeller blades was remarkably slight. Tests made by the William Cramp & Sons Ship and Engine Building Company of Philadelphia, who are the sole manufacturers for the United States of this bronze, gave a tensile strength of 66,108 pounds and an elongation of 29 per cent. This test piece was cast on the face of one of the blades for the "Noordland," and may therefore be considered as accurately indicating the quality of the metal in the entire blade. Owing to the fact that no marine growth takes place on these propellers and that there is no corrosion, the speed of the vessel can be kept more closely to its standard. Each of the three blades of one of the screws of the "Campania" weighs about 8 tons and cost as fitted over \$17,500. It has been found that the advantages more than offset this high first cost. This bronze is also used for tubing, pump rods and linings, valves and parts requiring strength and non-corrosive qualities. Parsons' white brass has been used in the bearings on the Government vessels built by the Cramps, and also in the merchant vessels built or repaired by them. The agent for these metals is G. Douglas Petrie of 39 Cortlandt street, New York.

WE HAVE RECEIVED from the Lodge & Shipley Machine Tool Company of Cincinnati, Ohio, an illustrated circular of their new turret chucking lathe. This machine was designed to occupy the same position with regard to cast-iron work that the screw machine does in its line. With this lathe blank gears, pulleys, fly wheels, drill press tables, and all parts of Corliss and slide valve engines requiring to be turned, bored and faced (the operations on this machine being simultaneous or separate at choice) may be gotten out rapidly and accurately.

THE HENDEY MACHINE COMPANY of Torrington, Conn., issue a catalogue describing the Norton improved screw cutting engine lathe made by them. In this lathe the ordinary train of change gears is mounted in the form of a cone directly on the screw of the lathe, to which they are secured by one spline. Motion is transmitted to either of these gears from a stud gear splined to a shaft parallel with the shaft of the cone and engaging with an intermediate gear which is mounted in a fork in such a way that it can be brought to engage either gear of the cone. In this way the cone can be arranged to cut the regular list of threads from 6 to 20. In a circular they also describe their 15, 24 and 25 inch pillar shapers.

THE BICYCLE POWER PLATING DYNAMO is described in a catalogue by the Hanson & Van Winkle Company of Newark, N. J. This consists of a cast iron column, near to top of which is placed an adjustable bicycle saddle and near the base of which is a shaft carrying two bicycle cranks of the usual form on a band wheel. The dynamo is mounted on top of the column. Electroplating of any kind within the capacity of the machine can be easily done.

A GENERAL CATALOGUE of pumping engines, steam pumps and hydraulic machinery built by Henry R. Worthington of 86 Liberty street, New York, has been received. This describes all the more important types of pumps made by this extensive establishment.

The loss to shipping off the Atlantic Coast caused by the great storms of the last two months is estimated to be nearly \$3,000,000.

THE WEEK.

The New York and New Jersey Bridge bill was passed by the House last week, after amendment so as to require the expenditure of \$1,000,000 per year after the first year, and that the work shall be completed within ten years. J. H. Swan of the Bridge Company, whose plan has been approved, is quoted as stating that almost all the railroads running into Jersey City have signed an agreement with his company to use one bridge and station, which will be built at Forty-second street, New York, between Broadway and Seventh avenue. The only great road that has not yet joined the agreement is the Pennsylvania, and its adhesion is promised when a guarantee of the actual building of the bridge and station is given.

Twenty vessels and 54 lives was the total loss on the great lakes during the furious storm which swept over them last week. The value of property lost is estimated at over \$700,000.

The Pullman Palace Car Company have apparently suffered less from the prevailing business depression than the majority of manufacturing industries. The report of the company's business presented at the annual meeting of the corporation in Chicago last week showed that more men were employed and higher wages paid during the past fiscal year than ever before in the company's history. The financial statement showed total earnings for the year to have been \$11,389,896, and operating expenses \$3,825,940. The total number of persons in the employ of the company in their manufacturing and operating departments is 14,635 and wages paid during the year \$7,751,644. The number of employees for the previous year was 12,809 and wages paid were \$6,619,156.

A Yonkers, N. Y., carpet manufacturing concern is reported to be shipping some large consignments of carpets to England in response to orders from the other side.

The British Admiralty have just placed an order for 1000 tons of Harveyized armor for the new battle ship "Renown."

The rapidity with which grain is now being handled in Buffalo is something quite unprecedented. During one day of 24 hours last week the receipts at that port aggregated 1,600,000 bushels.

The "Cevic," a cargo steamer recently launched from the yard of Harland & Wolff, Belfast, Ireland, and destined for the transatlantic trade, is by far the largest cargo vessel in the world. This steamer is 500 feet in length, 60 feet in breadth and 38 feet in depth. Her estimated gross tonnage is 8315 and her total capacity of holds 14,089 tons. The vessel is fitted with two sets of triple expansion engines.

A heavy frost which visited the South at the beginning of last week caused severe injury to crops and vegetation in Tennessee, Louisiana and Mississippi. Cotton will, it is calculated, suffer to the extent of 15 to 20 per cent. of the crop.

Ex Senator H. G. Davis of Baltimore, Md., is said to have started a promising new industry, namely, the shipping of West Virginia coke to the silver mining districts of Mexico.

A new coaling device for ships at sea was tested off Sandy Hook last week,

when the U. S. flagship "San Francisco" was coaled by the "Kearsage" while the ships were 200 feet apart, and steaming at the rate of 4 knots an hour. The system, which is on the trolley principle, is the invention of Philip H. Low, an ex-United States navy officer, and its advantages in obviating the necessity of using shore coaling stations in certain cases—such as war times, &c.—are obvious.

An electric hearse is the latest innovation in trolley transportation in San Francisco. The vehicle is in use on a railway leading from the city to four suburban cemeteries.

The cattle slaughtering record of the world was beaten last week at Armour's Kansas City packing house, where 3218 cattle were killed in 11 hours, the average being five a minute.

No more striking evidence could be given of the prevailing dullness in business than the announcement that the Reading road is to withdraw no less than 28 passenger trains from its system, including eight from the New York division and 12 from the main line.

It is probable that New Haven, Conn., will spend \$100,000 in repairing several of its bridges.

Work is progressing rapidly on the new buildings of the United States Armory, at Springfield, and already finished work has been done on the new Krag-Jorgensen arms.

The *Railway Age* mentions that recently two steamers carried away, within 24 hours, as much freight from Chicago as all the railway lines leading to the East in that time, notwithstanding that the latter have cut down their rates to the closest of margins.

New Publications.

SEVENTH BIENNIAL REPORT OF THE BUREAU OF LABOR STATISTICS OF ILLINOIS, FOR 1892. By John S. Lord, Secretary of the Commission.

As a statistician on the coal trade of Illinois Mr. Lord has been long and favorably known. He is now working in a wider field, and has embodied in the report just issued the results of a very elaborate investigation concerning the working women in the city of Chicago. The inquiries of the bureau have been directed to the earnings and environment of the working women and girls in that city. The investigation covered not alone the transcription of wages and work record of each person from the pay rolls of the establishment with which they were connected, but extended also to the personal earnings of the employees. Facts have been gathered not alone relating to their incomes, but also to their expenses, their place of abode, manner of living, and various details of personal description. In this way statistical details have been gathered on the work, wages and welfare of 5099 women, employed in 95 establishments and 43 industries, and pursuing 474 different occupations in the city of Chicago. Mr. Lord summarizes his data relating to wages as follows: "We find that 21 out of 4526 employees were working for less than \$2 a week; also that 17 were receiving \$20 or more per week. Between these extremes the greater numbers are massed in three classes earning from \$4 to \$7 a week, as follows: 675 received from \$4 to \$5; 882, from \$5 to \$6; 860, from \$6 to \$7; total, 2417. Below this central group are found 680

who earn less than \$4 a week, and above it are found 1429 who earn from \$7 to over \$25 a week. This, then, is the general statement concerning 4526 women and girls employed in 90 establishments, in 41 industries, the same being all the employees of every rank and grade in each establishment—viz.: That 15.02 per cent. of the whole number earn less than \$4 a week; 53.40 per cent. earn from \$4 to \$7 a week, and 31.58 per cent. earn from \$7 upward."

Data are also presented on the amount of time lost, the expenses, including board and lodging, clothing, sickness, car fare, &c. It appears that board and room to those who pay specific amounts for them absorb 56.4 per cent. of the average earnings; that the item of clothing requires an average expenditure of 21.5 per cent. of the income, making a total for subsistence and clothing of 78 per cent. of the income. Mr. Lord has also gathered statistics of age, nativity, conjugal condition and residence, health and home surroundings, the whole showing an industry and a care which make the report particularly valuable.

An incidental though natural outcome of the inquiry was the collection of data relating to the sweating system in the clothing trade. The canvass of the bureau has disclosed the fact that there are 666 shops with which there are connected, working either in the shop or at home, 10,938 employees, which is very much less than the usual estimate, which ranged between 30,000 and 40,000 employees.

The third part of the volume deals with the statistics of coal mining in Illinois, compiled from the reports of the State inspectors. In this it is shown that during the year ending July 1, 1892, the total number of net tons of coal of all grades mined was 17,862,276. The statistics embrace details relating to labor, both in hand mining and in machine mining. Figures are given concerning the tonnage of coal mined by machine, the number of machines used in the different mines and the number of men employed in connection with them. Mr. Lord has also investigated the question of the consumption of powder in the mines, which shows that the tonnage of coal per keg used was 39.5 tons, while in machine mining it was 95.3 tons per keg. The usual accident statistics are appended. The general report is followed by the detail reports of the different mine inspectors' districts.

BOLIVIA. Bureau of American Republics; Bulletin No. 55, Washington, 1892.

The Bureau of American Republics has added another to the series of manuals on Central and South American countries. The last issued is that on Bolivia, the general plan being followed which has been adopted in all the publications of this series. The first part of the work deals with the geography, climate and resources of that country, while the second section reproduces the political constitution of the Republic and gives in full the import duties of Bolivia.

AERONAUTICS is a new monthly publication which is the outgrowth of the recent International Conference on Aerial Navigation. It is published by the *American Engineer and Railroad Journal*, 47 Cedar street, New York, whose editor is the well known engineer, M. N. Forney. Those who believe in the future possibilities of flight will find it a useful aid in their study.

The Iron Age

New York, Thursday, October 26, 1893.

DAVID WILLIAMS, - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - EDITOR.
GEO. W. COPE, - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - HARDWARE EDITOR.
JOHN S. KING, - - BUSINESS MANAGER.

The Effect of Cheap Steel Beams.

The low price of steel beams is now opening up a wider field for them. They are no longer a luxury, available only by those erecting large buildings and to whom cost is a secondary consideration. Builders of moderate sized structures are using them freely in the place of large wooden girders. Warehouses and stores, with no architectural pretensions whatever, are now absorbing considerable quantities of beams, whereas but a short time since they would not have been seriously considered by the builders. Some progressive architects are even specifying them for use in certain places in dwelling houses. Notwithstanding the general depression in the building trade at present the tendency to substitute steel beams for wood is a notable feature of the beam business, and manufacturers are hopeful that the movement will continue to grow. In this prospect of enlarged consumption in the future they see some compensation for the very low prices now ruling. Cheapness is a very effective missionary.

With the movement begun for the use of steel beams in ordinary structures, a great deal has been accomplished which will be of much value if it is persistently followed up. There are many architects and builders who know but little practically of the use of steel beams. They need to be informed of the manner in which such material can be used in partial steel construction. This is a line in which it might be well for the manufacturers of beams to do some educational work. In the construction of buildings, particularly in large cities, economy of space is often very desirable, and a steel beam will often be found decidedly preferable for that reason to a bulky wooden girder. Again, the matter of shrinkage is something that proves very annoying to builders, who find their best work frequently marred by the unexpected shrinkage of a large girder, guaranteed perfectly seasoned, but susceptible to atmospheric changes, as all wood is. There is hardly a house of moderate size in which some steel beams could not be used to advantage. In building expensive dwelling houses, however, architects and builders by the use of steel beams could make them either fire proof or of a "slow combustion" type. It would be of much interest in this connection if some competent person were to make a compar-

ison of cost between such a house and one fitted with wooden joists. It is believed that the enhanced cost would be found so moderate that the man who could afford to build such a house would prefer to pay the increase and not only enjoy the sense of security from danger of fire but find an absolute saving in the lessened cost of insurance.

Beam manufacturers could very profitably to themselves follow up this educational work and instruct builders in the special advantages to be realized from the enlarged use of steel structural material. In entering this field it might be found necessary to make modifications in the shapes and sizes of beams now standard in order to meet new requirements. In the construction of dwelling houses there would, for instance, be no necessity for using the heavy beams now made. Perhaps 3 or 4 inch beams, properly stiffened by cross beams, would be found suited to a great deal of such work. Beams of this size, weighing much less than standard beams, would not be a very costly investment for owners desiring fire proof or "slow combustion" houses, although manufacturers would probably charge more for them than for the heavy sections, being more expensive to roll. There is certainly a most inviting field opening up in this direction for the beam trade and as the era of low prices for beams has apparently come to stay it is likely to prove in the future a better business in point of value than has thus far been enjoyed from the construction of large buildings.

The World's Fair Closes October 30.

The managers of the World's Columbian Exposition have acted wisely in deciding to close on the 30th inst. This is the day which has been set for the termination of the fair from the time when the preliminary arrangements for the enterprise crystallized into definite announcements. It is not surprising that the enormous increase in attendance which has characterized October should have inspired many individuals interested in the affairs of the exposition to plan for its prolongation beyond the official date of closing. They are so numerous and influential that at one time an apparently authorized statement was published that the fair would be continued as far into the winter as the weather would permit, and that next year another six months' fair would be held on the exposition grounds, even if it were confined entirely to domestic exhibits. The legal advisers of the management, however, promptly showed that there were many obstacles in the way in the nature of legislative enactments and innumerable contracts, all based on an early termination of the existence of the enterprise. Complications of an apparently insurmountable character were thus set forth, and enthusiastic advocates of prolongation

became convinced that their plans were not feasible. This is well, as it would be a reflection on the splendid management of the fair hitherto if it were to be permitted to run until it simply "petered out" as it would assuredly do. A general feeling of regret is experienced that the magnificent architectural effects of the exposition buildings cannot be preserved. If it were possible to permit the buildings to stand as they are, there is no doubt that they would prove a great attraction to strangers visiting Chicago who have not had an opportunity to attend the fair. But there are many reasons why even this cannot be done. The buildings will be demolished and every vestige of them removed at as early a day as possible, and their beauty will then only be a memory.

Defense of the Atlantic Coast

Gen. O. O. Howard, commanding the military department of the East, in his annual report, just published, strongly urges the establishment of a more efficient system of coast defenses for the great ports on the Atlantic Coast. While admitting the defensive value of the navy and of the naval reserves, he reminds the Government that the work of this arm in time of war would be rather in the offensive department, so that for the defensive purposes of permanent works the sea coast batteries, including mortar shells and other projectiles and all the modern torpedo preparations, must be kept in mind. General Howard is of the opinion that the first attention is needed for the most important ports—e. g., New York, Boston and New Orleans. But the defense will, he thinks, fall far short of what it should be until such cities as Philadelphia, Baltimore, Washington and those near Hampton Roads, as well as Charleston, Savannah and Mobile, are properly covered by defensive works, well manned and properly equipped with modern ordnance. General Howard's convictions on this head are evidently shared by other experienced military authorities, for the Inspector-General of the Army—Brig.-Gen. J. C. Breckinridge—in a recent report pronounced the condition of affairs in the matter of coast defense as "disgraceful," particularly on the Southern coast, which, he says, is "wholly unprotected and at the mercy of any enemy, the forts crumbling away, the cannon rusting and the gun carriages rotting." Twenty-seven forts have, during recent years, been entirely abandoned, and are gradually becoming dilapidated ruins. General Breckinridge strongly recommends their being put in order and regarrisoned, and he would have all the guns remounted, cleaned and generally repaired, if nothing better can be done at present. Congress, however, is proverbially slow to move, and the important matter of coast defenses appears to have taken a back seat of late years in Washington. Happily there is no

immediate likelihood of a foreign war; but should such a remote contingency arise, the condition of our Atlantic and Gulf Coast defense—or want of defense—as described by such competent authorities as the general officers above quoted, must cause grave misgivings.

As Foreigners See Us.

Thousands of foreigners have visited the United States for the first time this year. The majority of them are men who are fairly prosperous at home. A few of them are professional exhibition visitors, and a small number are people of leisure traveling to escape boredom. With these few exceptions they are professional and business men who have come to study for themselves the resources and the methods of work of this country. The last few decades have opened the eyes of Europe to our development, and the appearance of American products in many branches of commerce and industry has foreshadowed threats of rivalry from the rapidly growing Western giant. Reports of the impressions thus gathered are becoming numerous in the European press and are not altogether flattering. Many of them are crude, and others are tainted by a spirit of fault finding. Some of our foreign visitors have failed to grasp the fact that conditions are not the same on both sides of the Atlantic, and that what may be good practice there would be an unprofitable method here. Still, honest criticism and kindly comment should be carefully considered by the victim.

One of the things which seem to have struck our visitors is the worship of bigness in America. The one thing which we are accused of never failing to urge with pride is the magnitude of what we show. They are struck by our love of inspiring awe rather than admiration. Our eagerness to dwell on numerical maxima astonishes and amuses them. To them there is little merit in the "biggest thing in the universe." Mere magnitude in their estimation fades into insignificance as compared with the merit of finished excellence and beauty. Unprejudiced Americans will admit that there is a good deal of truth in that criticism, but they will at the same time acknowledge to themselves that in that respect we are not now really quite as bad as we were.

Another matter which foreign visitors are apt to refer to is coupled with the utilization of our enormous resources. We have often observed that a feeling akin to envy pervades their study of our natural advantages. But the one point raised, particularly by the thrifty men from the Continent, is the reckless and often criminal wastefulness which characterizes so many of our operations. Our skinning of the soil, our savage inroads into our forests, the careless destruction for further use of much of our mineral treasures, our neglect in utilizing waste products and old materials, are

astounding to them, and at times give rise to indignation and disgust. They point out that we are quick to adopt some makeshift and go on renewing it at frequent intervals rather than spend the money for one lasting structure. The same lavish extravagance pervades the whole community from the laborer to the captain of industry. It obtrudes itself upon the foreigner in private, municipal, national and industrial affairs, and is to him our greatest reproach and our most serious source of danger.

Let it be conceded that it may pay to waste, that posterity has no rights which the living are bound to respect, and yet, with all that eliminated, the criticism that Americans are wickedly wasteful remains only too true. It cannot be contemptuously waved aside as a proof of a mean spirit. We believe that, on the whole, it is one of the principal sources of comfort which has come to those Europeans who have studied our capacity as rivals in the early future. They frankly say that as long as we go on in the extravagant manner apparently habitual with Americans, high and low, they need not fear us as competitors. It is possible that the very sharp lesson which is now being taught us will rid us earlier of a national sin than our foreign friends anticipate.

PERSONAL.

Theodore Fry, M.P., an English iron-master, who was a member of the party of the Iron and Steel Institute in 1890, has the distinction of having made the fastest trip of record between Queens-town and Chicago.

Professor W. Hartmann of Berlin who was the representative in Chicago of the German Society of Engineers, sailed for home last week.

H. W. Borntrager of the Carnegie interests at Pittsburgh sailed for Germany this week for the purpose of bringing his family, who have been abroad for some time, to this country.

A correspondent in commenting on the article which appeared in *The Iron Age* of last week regarding a shipment of American pig iron to England confirms the view taken of the circumstance and says that a similar hubbub was raised in 1884 when a shipment of Michigan charcoal iron was made to Liverpool to be used for special malleable castings, for which it was difficult to find a metal that was suitable. At that time our correspondent was in Scotland and during his visit attended a meeting of a literary society at which the subject was referred to by a member, who took exception to what was said by the lecturer of the evening. The lecturer had taken for his subject "Nothing New" and had endeavored to explain that the many wonderful happenings of the century had a parallel or origin in the history of civilization. The critic of the evening asked if it was not something new for pig iron to be shipped into England, as had recently been done by Americans. The lecturer admitted that it was a new departure so far as America was concerned, but the circumstance was not a precedent, as primitive pig iron was shipped to England from the shores of the Mediterranean many centuries before America was discovered.

CORRESPONDENCE.

Copper Coating the Hulls of Vessels by Electricity.

To the Editor: The interesting article on electro copper plating steel vessels in a recent issue of *The Iron Age* shows that it is admitted by those most competent to judge that as a protection to the hulls of steel vessels a sheathing of copper is superior to anything else, and the electrical method of the Ship Copper Plating Company you describe is, to my mind, the cheapest and most practical way of applying such a sheathing. The figures you give as to the rate and cost of depositing a copper sheathing by their method, while correct in the main, are not as clear as they might be, and if not carefully read give the impression that the plating of a ship 400 feet long would require a plant of 780 horse-power. The following figures will, perhaps, give a more clear idea of the time and horse-power required.

Taking the thickness of the copper coat to be deposited as $\frac{3}{16}$ inch and the correct density to be used as 12 amperes per square foot, the time required to deposit such a coat will be about 72 hours. For a square foot of copper $\frac{3}{16}$ inch thick will weigh a little over 36 ounces. And as one ampere will deposit nearly 1 ounce of copper in 24 hours 12 amperes will deposit 36 ounces in a little over 72 hours.

The electromotive force required will be $2\frac{1}{2}$ volts, and if 120 10 x 4 feet tanks are in use the electric horse-power required will be a little over 193, as is shown by the following figures: The combined surface of the 120 tanks will be 4800 square feet, which multiplied by 12 amperes will give 57,600 amperes; this multiplied by the voltage gives 144,000 watts, or a little over 193 horse-power. Taking the efficiency of the electrical plant at only 80 per cent. it would at no time take more than 241 horse-power to run 120 tanks.

J. D. DARLING.

FRANKFORD, PHILADELPHIA, October 17, 1893.

OBITUARY.

JOHN O. HUGHES.

John O. Hughes, senior member of the firm of Hughes & Patterson, iron manufacturers at Kensington, Philadelphia, died suddenly in Chicago on the 18th inst. of heart disease. Mr. Hughes, together with his wife and Mr. and Mrs. John Fritz of Bethlehem, were visiting the exposition when death came to Mr. Hughes without a moment's warning. Deceased was born in Denbigh, Wales, in 1832, and when a young man emigrated to this country. He became identified with the iron trade, and entered the firm of Hughes, Morgan & Caskey, by whom, in 1870, the Delaware rolling mill at Kensington was erected. The firm afterward became Hughes & Patterson, and in 1877 Walter Hatfield was admitted to an interest. The Philadelphia rolling mill, at Beach and Vienna streets, Philadelphia, was purchased by the firm in 1889 and added to the plant, the total annual capacity being 27,000 net tons of bar iron, iron specialties, skelp, bands, hoops and rods. Robert Patterson died last April, and on May 1 Robert J. Hughes, the eldest son of the senior member, was given an interest in the business. Mr. Hughes possessed a thorough knowledge of the iron busi-

ness, and it was mainly by his efforts that the establishment was brought to its present size. He was a well-known club man, but never associated himself with politics.

S. P. HINKLEY.

S. P. Hinkley, manufacturers' agent, whose office was located at 101 Lake street, Chicago, died in St. Louis on October 18, while in that city on business. He was born in Somersetshire, England, in 1838, and came to America when he was 20 years of age. He had been a sufferer from heart trouble for several years. Mr. Hinkley represented the Samson Cutlery Company, the Crescent Saw Company, and Joseph McCoy & Co., at the time of his death. He was about 55 years old, had been a hardware salesman of many years' experience, enjoyed a wide acquaintance, and was highly esteemed for his many excellent qualities of head and heart. He leaves a widow and two sons.

Sheet Mill Wages.

When the iron and steel roofing business commenced its rapid development into a very important industry some 12 years ago competition became brisk, and in order to compete successfully many roofers decreased the weight per square foot of flat sheets used without changing the gauge marked thereon, so as to keep their cost down and even up on the reduced prices at which their finished goods were sold. According to the old standard No. 27 used to weigh 72 pounds per square, flat, but it was reduced to 68 pounds, 66 pounds, and finally to 64 pounds. When the lowest figures were reached the Iron and Steel Roofers' Association condoned the sin of their brethren by adopting a new standard, taking Haswell for authority. According to the new table of weights No. 27 was made to weigh $\frac{5}{16}$ pound per square foot, but according to the rolling mill table of weights as printed in the agreement entered into with the Amalgamated Association of Iron and Steel Workers sheets rolled to this weight should be classed as No. 28 gauge, and upon that basis the mills of the Wheeling district have always paid their rollers. When the Roofers' Association established their weights attempts were made to get $\frac{5}{16}$ pound sheets rolled at No. 27 price, but the workmen objected and have always received the full No. 28 gauge price, which was \$10.40 per ton. Pittsburgh mills also made settlements on the same basis, but many mills outside these two districts succeeded in getting $\frac{5}{16}$ pound rolled for No. 27 price, \$9.60 per ton, thus gaining an advantage of 80 cents per ton over some competitors, while the scale of wages signed was in each case identical. Since July 1 the legal standard of weights for various gauges of iron and steel sheets has become the basis of settlements and No. 27 now weighs $\frac{5}{16}$ pound, the price for rolling the same being \$10 per ton. This change places the mills that formerly paid \$9.60 for No. 27 gauge in a worse position than they were prior to July 1, as they now pay \$10 for rolling $\frac{5}{16}$ pound whereas they used to get $\frac{5}{16}$ pound rolled for \$9.60, a difference of 40 cents per ton. This is the principal concession known to have been made by workmen. In explaining the matter workmen will say that they were ignorant of the exact weight of the sheets they were rolling, but such a statement does not destroy the fact. In

like manner many other concessions were made (with a wink) when mills were able to secure large orders for sheets rolled to special weights which came between two gauges of the recognized table. Although contrary to the rules of the A. A. of I. and S. W., one instance is known where No. 27 $\frac{1}{2}$ gauge was paid, half the difference between No. 27 and No. 28 being added to the price of No. 27. This occurred at an isolated mill. It is right that concessions of this kind should be made between employers and employees, provided neither side belongs to an organization, but when organization does exist and both manufacturers and workmen are supposed to be placed upon an equal basis in their respective competition, the basis should be maintained or organizations should be disbanded and local agreements govern the matter of prices to be paid for labor.

Trade-Marks.

We are indebted to Francis Forbes, secretary of the United States Trade-Mark Association of New York, for copies of a series of valuable papers read at the Congress of Patents and Trade-Marks at Chicago. The subjects discussed are of such importance to manufacturers that we present the leading features of some of the papers.

The Present Condition of the Trade-Mark Law in the United States.

BY J. M. BATTLE OF ST. LOUIS.

The practice of designating certain manufactured products by trade marks and labels is one that has met with the approval of the public, having many advantages in its favor, while few, if any, objections are to be made against it.

It would seem that the statutes of the United States which created the trade mark would throw around it every safeguard, and make it as sacred as other rights so highly prized by the American people. The history of trade-mark legislation shows that Congress has had this object in view, but unfortunately has been thus far unsuccessful in the work of perfecting a law which the courts will uphold, and to-day the statutes of the United States provide no penalty for imitating or counterfeiting trade-marks or labels.

The holders of trade marks may proceed against infringers by civil action under both Federal and State laws, and many States inflict penalties for violation of trade-mark rights; but for many reasons, unnecessary to enumerate here, a Federal penal law is necessary. Many ordinarily well informed persons presume that we now have such a law, and indeed it is to be found in the Revised Edition of the U. S. Statutes, but it has been decided by Judge Brewer (40 Federal Rep., page 250) to be "a dead letter," and it is only necessary for us to know that it is such, without tracing out the technicalities involved.

In consequence of legal entanglements, the dishonest dealer resorting to imitation, counterfeiting and substitution has become bolder and bolder in his nefarious work. Almost every meritorious trade-mark article known to commerce has been made the basis for such depredation. One can scarcely find an advertisement for such goods which does not contain the warning "Beware of imitations." It has been said in an editorial in one of our leading papers that it has come to pass that the more the manufacturer advertises his trade-

mark goods the more the imitator fattens and flourishes. As far as the manufacturer is concerned this contemptible practice is simply a robbery of his name and profits, a practice that ought not to be tolerated or indulged in by any man who respects himself or the rights of others.

The people are made defenseless victims. They have learned to depend upon certain trade-mark articles, the value of the genuine of which they know by experience, and the fraud practiced upon them by imitation not only deprives them of the right to the identical thing they are giving up their money for, but often endangers the life or health of the person imposed upon. Take for example many proprietary foods and medicinal preparations used in the treatment of disease and in surgical operations. The physician is familiar with and satisfied with the nature and quality of certain proprietary articles and frequently resorts to their use. It requires no great stretch of the imagination to contemplate the magnitude of the offense of supplying him and his patient with an inferior or worthless substitute—it is simply heinous. Infirmary or death is the result to the patient. The reputation of the physician is damaged. The guilty druggist, however, has made a few cents more than he would have done had he sold the genuine article, and he continues to pirate and thrive without molestation.

Congress has shown a disposition to curb this evil. At the last session a bill was introduced by Mr. Hall of Minnesota providing for the proper registration of trade-marks and labels, settling disputes concerning their rightful ownership and providing punishment for parties found guilty of imitating them or the goods to which they apply. This bill was considered by the Committee on Patents and favorably reported to the House of Representatives, where it failed to reach a hearing for want of time. It will be presented to Congress again at this session either by Mr. Hall or some member of the Committee on Patents, and every honest man in this land who can exert any influence upon a member of Congress should do all in his power toward obtaining for it a full hearing. There is no doubt about it passing, if fully considered.

The question may arise, why is it necessary to influence the members of Congress to take action upon a measure of such manifest importance and justice? At the last session of Congress there were pending over 10,000 different measures, and at this session there will be as many, if not more. It is not reasonable to presume that any human being can within the limited time carefully read this great number of bills, separate the good from the bad and concentrate his thoughts upon the few that should become laws. Use every opportunity in person and by letter to press it upon the minds of the Congressmen and keep it uppermost in their thoughts. If concerted action is taken by parties interested this bill will become a law. Then the manufacturer will no longer be robbed with impunity. Then the buyer will obtain the identical article he pays his money for.

Trade-Marks From the Manufacturer's Point of View.

BY EBERHARD FABER.

The manufacturer who expects to sell articles made by him because he believes them meritorious will adopt and affix some mark to them as a sign indi-

cating to the purchaser the way of return to the article. He thereby establishes a good will of his business.

While the quality and character of the article are preserved the tendency to a return to purchase is sure; but if the quality or character is changed by a manufacturer, or if the purchaser is so often deceived by spurious articles that he cannot be sure of the original sign, then the manufacturer's trade is lost and can only be regained, if at all, at great cost.

In the notable litigation in the year 1877, between Colman & Co. and Crump, over the bull's head label for mustard (reported in the New York Court of Appeals Reps., Vol. 70, p. 573), it was alleged on the part of the plaintiff that their sales had dwindled from a very large to a very small amount and that while so dwindled some 6,000,000 spurious bull's head labels had been sold for application to packages of so-called mustard.

Again, a manufacturer of salaratus, long since out of business, stated that he went abroad, leaving his business in the hands of an agent who had full control. At the time of leaving the sales were very large, and the packages honest and full weight. On his return two years afterward he found that the pound packages had shrunk to $\frac{3}{4}$ pound and all others in proportion, and that the trade had shrunk to one quarter of its former value. He attributed the loss of sales to the deception of the purchaser. He closed the business. Many instances of this kind are familiar to every manufacturer. The fierce competition of late years and the striving of many establishments to produce and sell goods at lower prices than others have led the more unscrupulous manufacturers to imitate goods of long standing reputation and bearing widely known marks.

All that the manufacturer of a uniform product meeting the wants of the people desires is to be let alone by imitators, retaining his sign or mark so distinct that the most unwary may be able to return and repurchase his product.

It is apparent that good morals teach that his wish should be observed. Anything which contravenes it is based on deception. Such deception can be restrained by the courts, but the proceedings have been and are expensive and uncertain, and many of the States have passed penal statutes for the repression of imitation, viz.: Arizona Territory, Arkansas, California, Colorado, Connecticut, Delaware, Florida, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maine, Massachusetts, Michigan, Minnesota, Mississippi, Missouri, Montana, Nevada, New Jersey, New York, North Dakota, Ohio, Oklahoma Territory, Pennsylvania, Texas, Utah, Washington, Wisconsin.

But still the manufacturer is not secure in the condition in which he believes himself to be placed and to which he is justly entitled by the rule of morals. He has neither a mark which will go everywhere and be protected everywhere nor proper means of ascertaining whether he may not himself be a violator of the moral if not the statute law. The latter is the more serious of the two questions in the United States, where there is absolutely no means of determining who is the first to adopt and use a mark, and therefore entitled to it. An approximation may be reached by a long series of advertising, *e.g.*, such as has been given to such well known articles as Spencerian pens, Sozodont, Rising Sun stove pol-

ish, Maizena, Sapolio, Armour's extract of beef, Pearlina, &c., but these have become known through the length and breadth of the land by a vast amount of advertising, and it is not to be expected that any one who had a prior claim would remain silent.

The actual condition of things which not only may but does exist is illustrated by the stove, which is a bulky article with a more or less local sale. A directory of stove marks issued a few years ago showed that all but one brand given were used by from two to five different manufacturers. When the British law of registration was adopted it was found necessary to allow any mark which was not then in use by more than three persons in different parts of the United Kingdom to be registered by each of the users up to three. If there were more than three users then the mark was considered a common mark and none were allowed to register. The British law has remedied this difficulty by requiring new marks to be published and registered, and there can now be no excuse for adopting marks similar to those already used by others. In this country, however, no national registration of all marks exists, and an attempt has been made by private means to ameliorate the condition of the manufacturer in this respect. I say ameliorate because no private enterprise can make the position more than tolerably safe. The means to which I refer is the United States Trade-Mark Association.

If the manufacturer is himself within the bounds of good morals and has adopted a trade-mark—perhaps struck out of a pleasant sound in a moment of inspiration and put into letters—he ought to be let alone in its possession, not only in his own country, but the world over. This would seem right to both the manufacturer and the consumer. In this age of the world, when the printing press is spreading the fame of an article everywhere, it is a matter of importance to the far away purchaser, who has only heard of the fame of the article or who has obtained a stray sample, that he be protected from imposition.

It is understood that a bureau for the international registration of trade-marks has been established at Berne, in connection with the Union for the Protection of Industrial Property between Belgium, Brazil, France, Guatemala, Great Britain, Italy, Netherlands, Portugal, Servia, Spain, Switzerland, Sweden and Norway, United States and Tunis. But registration can only be made at this bureau through the intervention of the nation. The United States has not yet made provision for such registration for its citizens.

I have called your attention to the prime needs of the manufacturer and to the means at his disposal to fulfill them. These means, it is evident, are not sufficient in this country, and it is proposed that united action should be taken by the manufacturers of the United States to establish a proper national trade-mark law superseding the present State laws on the subject.

Not until then can any manufacturer be safe in the good will which he has created for his products, or in the esteem of his fellow citizens which comes from respecting the rights of others. The Supreme Court of the United States has held (*McLean vs. Fleming*, 96 U. S., 245) that an injunction might be granted after a lapse of ten years of continuous use against the second user of a mark—*i. e.*, the one who was unfortunate enough to be second in point

of time to adopt the mark—and this might happen although the second user had not intended to infringe anybody's rights. It is outrageous that such a pit should exist, into which the cautious may fall. In a country where registry laws in their proper form prevail such a case could not happen, because suit could not be brought except upon a registered mark. The registration allowed in this country not being required as a prerequisite to a suit, is not of such a complete character for marks in existence as to be of any aid in assuring the adopter of a new mark that he is not taking something which belongs to another.

It seems to be necessary for the public good that provision should be made by the nation for the proper adoption and continued use of marks indicating the particular manufacturer, and that further provision should be made for the full use by our citizens of international registration.

Trade-Marks.

BY ELIJAH A. MORSE, CANTON.

The value of State and national legislation for the protection of property rights in trade marks cannot be over-estimated. Property in trade-marks has been recognized in civilized nations for centuries, and in more modern times by legal enactments to protect, secure and defend the owners of trade-marks. Although, unfortunately, a United States national law on this subject, making piracy a penal offense, was some years since declared unconstitutional by the Supreme Court of the United States, I regard the matter of so grave a moment that I think it of sufficient importance in this country to secure if possible a constitutional amendment, giving Congress authority to re-establish the old law upon this subject, owners at present being compelled to defend their rights under the common law and State law. A uniform trade mark law for the whole country—like a uniform bankrupt law—would be of great value.

Why should trade-marks be protected? 1, untold millions of money are invested in the manufacture of articles, and untold thousands of men are employed in industries protected by trade-marks, and upon the protection of which the continuance of these industries depend. 2, no one is more interested in defending the rights of owners of trade-marks than the consumer, who thus learns to distinguish the kind and quality of goods which he wishes to buy, and which he is well nigh certain to obtain under protected devices and trade-marks. Impair, or destroy or refuse to protect such marks and the property rights in them and such benefit to the consumer (in many cases priceless) is lost. 3, the protection of trade-marks prevents ruinous competition, which compels an inferior quality, short count and short weight to meet the demands of competition when the article is not so protected.

I look upon associations for the protection of trade-marks and legislation to that end as wise and far reaching statesmanship, beneficial, 1, to the manufacturer; 2, to his employees, by insuring them permanent employment; 3, to the merchant, wholesale and retail, by largely lightening the labor of personal examination of goods purchased and sold, the trade-marks in most cases being a sufficient guarantee of quality, weight and count; 4, by the great benefit to the consumer, by insuring him in his purchase of certain marks a uniform and known

quantity, quality, weight and count of merchandise, in the case of drugs, medicines, prepared foods for the sick and surgical instruments, for instance, often a case of life and death.

I should hope that this Congress would memorialize the civilized governments of the world for continued and additional legislation for the defense and protection of property rights in trade-marks.

MANUFACTURING.

Iron and Steel.

The Indiana Iron Company, Muncie, Ind., manufacturers of bar iron and steel, recently made a proposition to their employees to pay them \$4 per ton for puddling and 25 per cent. less on last year's scale for finishing. This proposition was not accepted by the men, and the probabilities are that when this plant resumes operations it will be started up as a non-union mill and on a scale of wages mentioned above.

For the past two months the Belmont nail department of the Wheeling Steel & Iron Company has been undergoing repairs. These have been completed and in all probability this department will resume operations in the near future. The Belmont blast furnace of this concern has also been undergoing repairs for some time, which have been completed and the furnace is again ready for operation.

We are advised that the report that Horace and Arthur Brock of Lebanon, Pa., had leased the Colebrook furnaces for a term of 20 years, and that the firm of Coleman & Brock would be dissolved, is entirely without foundation. It will be remembered that the Colebrook furnaces are at Lebanon and are operated by Robert H. Coleman.

The Eureka Cast Steel Company of Chester, Pa., are, besides repairing the damage caused by the recent fire at their works, increasing their open hearth plant to three times its former capacity. They expect to commence running about the first week in November.

The puddling department of the Passaic Rolling Mill Company, at Paterson, N. J., has closed down.

The Pittsburgh Iron & Steel Engineering Company of Pittsburgh are erecting a number of iron buildings for Wm. Clark's Son & Co. of the Solar Iron Works in that city. These buildings are three in number, being 100 x 100, 60 x 218 and 56 x 260 feet in size, and will replace former frame structures recently damaged by fire. The first mentioned firm have also closed a contract with Geo. A. Macbeth & Co., glass manufacturers, of Pittsburgh, for the erection of seven iron buildings covering their entire equipment.

The Ohio Iron Company, Zanesville, Ohio, manufacturers of bar iron, are operating two mills. These works are being run on a non union basis. At one time many of the workmen were colored, but the company now find no difficulty in securing enough non-union white men to fill the crews for such part of their plant as they desire to operate. A full force of men could be easily secured if required.

It is stated that the steel rail mill located at Alexandria, Ind., last spring by the DePauws, and which was partially completed when the DePauw failure occurred, will be finished by the Union Trust Company, who were made assignees of the DePauws.

The Cambridge Iron & Steel Company, Cambridge, Ohio, are operating three of their four sheet mills and are adding another pot to their galvanizing shop. This plant is equipped with the Bayliss patent pots manufactured by Davis & Co., Wolverhampton, England. It is claimed that this system effects a great saving of labor, as the sheets are carried automatically from the pickling vats through the metal pots to the shipping department. Another claim is perfect distribution of metal over the surface of the sheets, all parts being coated evenly. This department is under charge of Thos. E. Cook, formerly of Saginaw, Mich.

It is stated that operations have been resumed in full at the North Branch Steel Works and the Mahoning Rolling Mill in Danville, Pa.

The American Sheet Iron Works of Phillipsburg, N. J., will, it is said, resume operations this week. About 100 hands are employed at these works.

One of the three stacks of the Andover Iron Company, at Phillipsburg, N. J., has been placed in blast.

The Bethlehem Iron Company of Bethlehem, Pa., have shipped to the Watervliet Arsenal, at West Troy, N. Y., for use in the 10 and 12 inch guns, 111 tons of material, consisting of tubes, jackets, hoops, &c.

The Woodward Iron Company have relined and blown in one of their furnaces at Woodward, Ala., and the second furnace will blow in as soon as the work of relining is completed.

The Monongahela Iron & Steel Company of Pittsburgh, manufacturers of muck iron, whose plant is located at Hays Station, on the Pittsburgh & Lake Erie Railroad, signed the Amalgamated Association scale last week. The plant of the firm contains 20 single puddling furnaces and onetrain of muck rolls, with an annual capacity of 15-000 net tons. It is stated that this plant will resume operations within a short time.

The Thomas Iron Company of Catasauqua, Pa., have resumed work on the erection of their No. 1 blast furnace at Hoken-dauqua, Pa.

Last week the puddlers in the employ of Brown & Co., Incorporated, of the Wayne Iron & Steel Works, at Pittsburgh, were requested by the manager to sign a paper agreeing not to join any labor organization of any kind while in the employ of that firm. The puddlers refused to sign the paper, and the puddling department, in consequence, has been temporarily closed down.

Recently Philips, Nimick & Co., operating the Sligo Rolling Mills, at Pittsburgh, notified their puddlers that it would be necessary for them to accept a reduction of 10 per cent. in prices paid for boiling, in order that the firm could compete with non-union mills in the Pittsburgh district and other places, where boiling is being done at considerably less than \$5 per ton. So far the men have refused to grant the request of the firm for a reduction, and at this time the puddling plant is closed down. It is not improbable that when operations are resumed it will be with non-union men.

Application for a charter for an intended corporation to be known as the Diamond Steel Company of Reading, Pa., has been made. The new concern propose to engage in the manufacture of iron, steel, or both. The plant of Rothenberger, Steel & Sassaman, in North Reading, will be transferred to this new corporation, and the mill will probably resume operations at an early date, as it is stated that a number of orders have already been received.

During this week the South Fifteenth street mills of the Oliver Iron & Steel Company, at Pittsburgh, will probable be put in operation in both the puddling and finishing departments. Only non-union men will be employed, as this firm some time ago refused to treat with the Amalgamated Association or recognize it in any capacity. It is also likely that the lower mills of this firm, situated in Allegheny, Pa., will be put in partial operation within a short time.

The rolling mill of the Oxford Iron & Nail Company, Oxford, N. J., has started up.

The Bessemer department and the rail mill of the Bethlehem Iron Company, at Bethlehem, Pa., have resumed operations after an idleness of two months.

Operations at the large plant of the Aetna-Standard Iron & Steel Company, Bridgeport, Ohio, are now being conducted as follows: In the Aetna department all of the bar mills and two sheet mills are in operation. In the Standard department everything is on in full, including the galvanizing and corrugating departments. This leaves but four sheet mills in the Aetna department as the only idle parts of the plant. This firm announce that they are prepared to fill orders for their different lines of manufacture promptly, and expect to keep those portions of the plant now running in full operation.

The blast furnace of the Jefferson Iron Works, at Steubenville, Ohio, has recently been relined and otherwise extensively remodeled and improved. Included in the improvements are two batteries of water tube boilers, supplied by the Babcock & Wilcox Boiler Company, with a total combined horse-power of 500. Waste gas from the furnace will furnish the

fuel for these boilers, and in the utilization of this gas some improved methods of handling will be used. It is said that this blast furnace will be put in operation in a short time.

A recent visit to the new plant of the New Castle Steel & Tin Plate Company, at New Castle, Pa., developed the fact that this concern have one of the most complete plants in every respect in the country for the manufacture of tin and terne plate. The buildings are all of iron and as nearly fire proof as could be made. The welfare of the employees was carefully looked after in the construction of the buildings, and they are so arranged that a very comfortable temperature can be maintained during the summer and winter months. The entire equipment is of the most modern design throughout, and will permit of the handling of both raw and finished material to the best possible advantage. The location of the plant is an admirable one, the concern having switch connections with three different lines of railroads. The plant of the Shenango Valley Steel Company lies just alongside, and this will enable the firm to purchase their billets at the very lowest market prices and at the same time insure a material saving in freight charges. As yet only black sheets for tinning purposes have been turned out, but in a short time the tinning department will be put in operation. It is the intention of the firm to make a full line of the different grades of tin and terne plate, and they will also be sellers of black sheets in the open market.

The plant of the Catasauqua Mfg. Company, at Catasauqua, Pa., has started up.

The business men of Belleville, Ill., have decided to raise \$15,000 to liquidate part of the indebtedness of the Belleville Steel Company, the creditors having agreed to permit a resumption of the steel works when that amount is made up.

Machinery.

The disastrous fire which recently occurred in West Forty-first street, New York, extended to the building Nos. 512, 514 and 516, occupied by P. Prybil as warehouses and storerooms for finished machines and patterns and shafting department. The building Nos. 520-524, in which are located the principal machine tools, as well as the drafting room, pattern shop, office, &c., was uninjured. The works comprised two five-story brick buildings, each 75 x 75 feet, with ample space between and behind them and connected by a tunnel and bridges. For this reason the structure known as the west building escaped damage. Mr. Prybil has issued a circular in which he states that in 38 years of business he has never experienced a fire before. He anticipates little or no trouble in filling orders.

Morse, Williams & Co., Philadelphia, manufacturers of elevators, have been running their plant on full time and are contemplating an enlargement in the near future. The company state that prices have been very unsatisfactory and collections slow, but an improvement is noticeable in the latter, and they believe that it is only necessary to restore confidence, through the prompt action of Congress, to bring about a speedy restoration of business.

The Chapman Valve Mfg. Company of Boston, with works located at Indian Orchard, Mass., report a very busy season; not only have the works run to their fullest capacity with their full quota of employees, but the increasing demand has made it necessary to run many nights to keep abreast with the orders. The reason for this business activity during the general depression is owing to the fact that the demand has been for specialties that this company make. Since the increasing importance of using steam under high pressure, Jason Giles, the company's general manager, conceived the idea of making a gate valve with a removable bronze seat, which should be especially adapted for high steam pressure. Such a valve was made and patented by him March 13, 1890, and afterward assigned to the Chapman Valve Mfg. Company. About all of the largest electric light and power plants in this country are equipped with Chapman valves. Another specialty, the increasing demand for which has contributed to the company's activity during the present season is the indicator valve, which was also patented by Mr. Giles. The demand has been very large and from all sections of the country, and although the company have increased their capacity very largely this season in erecting a brick building 234 feet long by 50 feet wide, yet at this time every

department is crowded to its utmost and still they are unable to keep up with the constantly increasing demand, and already have booked orders which will keep the present force of upward of 300 employees busy during the entire winter season and until spring trade opens.

The Stow Mfg. Company of Binghamton N. Y., manufacturers of the Stow flexible shaft, report that their trade up to October 1 shows an increase over that of the corresponding months of 1892. During the past two months they have greatly improved their plant, adding largely to their boiler capacity, &c. They report a decided improvement in October sales over those of the preceding month.

Palmer & Co., dealers in machinists' tools, mills, factory and railroad supplies, of Philadelphia, are now at 26 North Seventh street, in that city. J. C. Palmer, the head of the concern, was a partner in the firm of Palmer, Cunningham & Co. of Philadelphia, lately dissolved by limitation. They are making a specialty of cold rolled steel, sharpened and hardened, and finished steel balls for bearings.

Maris & Beckley of Philadelphia are completing two 6-ton traveling cranes for the Altoona Mfg. Company, Altoona, Pa. These cranes are built with two speed hoists. They have also approaching completion a 5-ton power crane for use over a pipe facing lathe, for the McNeal Pipe & Foundry Company of Burlington, N. J. In this crane all the movements are controlled by one man from the floor, through levers fastened to the wall. Among recent shipments made by the firm was a crane to the Continental Iron Works, Brooklyn. They report inquiries for quite a number of their cranes, many of them from abroad, among which they mention one from Aberdeen, Scotland, for three cranes.

The Garvin Machine Company of New York have opened a salesroom in Philadelphia at 51 North Seventh street.

A number of the boiler makers at Wickes Brothers' Foundry & Machine Works, Saginaw, Mich., went on strike on account of a reduction in pay for overtime on contract work.

The foundry known as the Mims' Iron Works Company, Limited, at New Orleans, La., has been destroyed by fire. The principal loss is on patterns and stock, since the structures burned were very old. The works did a large business in the manufacture of steamboat, sugar house and rice mill machinery.

On the petition of the assignee of Pedrick & Ayer of Philadelphia, manufacturing machinists, who assigned September 5, Judge Reed has made an order restraining the Sheriff's sale of the effects of the firm, and authorizing the assignee to make up all the stock on hand and transfer the proceeds to the execution creditors. This order was made owing to the fact that when the assignment was made there was a large quantity of working stock on hand, and the firm had a number of unfilled orders, and that at a public sale which was to have taken place under the execution the creditors would sustain a great loss. An appraisal of the assigned estate was filed, showing assets aggregating \$93,599.94.

The Hendey Machine Company, manufacturers of machine tools, at Torrington, Conn., have been running their works for the past two months five days per week and eight hours per day, and have about three-quarters of their full force at work. They have sold a few machines in this country during the past two months, and have sent a number abroad, but their business has been unusually light compared with previous records. The company look for very little improvement in trade during the balance of the year, but believe that business will pick up rapidly after the inauguration of the new year.

The buildings for the new plant of the Dean Bros. Steam Pump Works, Indianapolis, Ind., will be completed about December 1. They will be more than double the size and capacity of the present works.

The Cincinnati Milling Machine Company of Cincinnati, Ohio, makers of machine tools, started their works about three weeks ago with two-thirds of the usual force, and are now running five days a week. With the orders in sight the company feel encouraged to believe that they will be able to continue in operation on this basis at least to January 1.

The Detroit Dynamo Company of Detroit, Mich., have just moved into their new factory, 121 to 125 Champlain street, where

they have about double the former amount of floor space. They now have equipped a complete machine shop, where they not only turn out their own machines complete, but are prepared to do a full line of repair work on all kinds of electrical machinery. The company have an order for equipping a new foundry in Detroit complete with motor power instead of steam and rope transmission. The company are acquiring a reputation for their electric lighting dynamos for isolated plants, and hope during the next year to almost double their business in this line.

L. Schneider has begun work at Winona, Minn., on a new boiler factory, 100 x 40 feet in size.

D. J. Bolenger's foundry, at Waynesburg, Ohio, has been destroyed by fire. Loss, \$5000; insurance, \$500.

Steps have been taken to establish at Columbia, S. C., foundry, machine and repair shops and depot for agricultural machinery of all kinds, the purpose of the scheme being to furnish to farmers of the State machinery at small cost. The capital of the company is to be \$10,000, business to begin as soon as \$4000 has been paid in.

Ground has been broken at Toledo, Ohio, for the construction of the new foundry and machine works of M. M. Donovan & Co. The main building will be three stories high and the foundry one story.

W. B. Pollock & Co. of Youngstown, Ohio, have started their boiler works.

The Lambert Point Iron Works, at Norfolk, Va., have been destroyed by fire. The plant was owned by Clark & Cunningham, and valued at about \$10,000.

A boiler and iron works is to be established at Meridian, Miss., by W. R. K. Standford.

Byram & Co., Detroit, Mich., have recently furnished a Colliu cupola to Wm. Clendinneng & Son, Montreal, P. Q., the Eastwood Wire Mfg. Company, Belleville, N. J.; two for the Ingersoll-Sargeant Drill Company, New York City, for their new shops at Easton, Pa.; the second one for Messrs. F. E. Meyer & Bros., Ashland, Ohio, and the Clinton Plow Company, Clinton, Mich.

The works of F. E. Myers & Brother, Ashland, Ohio, manufacturers of pumps of various kinds, are now in operation, with a larger capacity for production of pumps than ever before. Some additions have recently been made to their equipment, among which is included a new 15-ton Colliu cupola in their foundry, and the refitting of the cleaning room with considerable modern machinery.

The Harrison Machine Works, at Belleville, Ill., which shut down two weeks ago, have resumed in all departments.

Davies & Thomas, founders and machinists, of Catasaqua, Pa., have received a contract for the foundry work for a new zinc works to be erected at Passaic, N. J.

In the courts at Pittsburgh last week, a petition was filed asking for the removal of the receiver for the Nations Mower & Reaper Company, whose plant is located at Latrobe, Pa. The petition was filed by Martin Cutter, who asserts that he was the owner of certain patents which he assigned to the company for \$15,000 worth of stock and \$120,000 in cash. There is still \$79,000 owing him, which the company cannot pay at present. The debts of the company are about \$8000, and it is claimed that if the stock was all paid up the proceeds would pay the debts. Mr. Cutter asks that the property be placed in his hands as tenant.

The Pittsburgh Porcelain Enameling Mfg. Company of Pittsburgh have been granted a charter, with a capital of \$10,000. The directors are David Boyd, Wm. Boyd and Ross W. Patton, all of Pittsburgh.

The brass manufacturers of Canada, at a recent meeting held at Toronto, decided to request the Canadian Government to withdraw the duty of 10 per cent. on raw material.

All the shopmen on the Union Pacific system, some 4000 in number, have been put on full time.

Hardware.

Landers, Frary & Clark, New Britain, Conn., are now running their cutlery works four days a week instead of three, but business in the other departments of the plant is duller, so that there is a shut down of three days per week.

The Hinkle & Gaither Mfg. Company, Laurel, Md., manufacturers of agricultural

implements, have nearly completed repairs to their buildings, and have all their machinery ready for operation. They will employ at the start about 50 men.

The Penn Hardware Company, Reading, Pa., have resumed operations.

The Crystal Mica Company's plant, at Warren, N. H., which has been idle through the summer, has started up and is running on full time.

The G. S. Foos Company, Springfield, Ohio, have disposed of their business to John Spencer and George O. Leedle, late treasurer of the company, who will incorporate a new organization to assume control November 1, when the manufacture of all kinds of wringers, lawn mowers, &c., will be continued. Ample capital and increased modern facilities will be provided. Mr. Spencer is referred to as a thoroughly practical and experienced mechanic.

The Rock Island Plow Works, Rock Island, Ill., resumed operations on the 16th inst. after a two-months shut down. About 250 men, less than half the usual force, are employed. The company have made a reduction of 10 per cent. in wages, and have shortened the working day for the present, so that the men work eight instead of ten hours.

The new warehouse of the Hatch Cutlery Works, South Milwaukee, Wis., was damaged by fire a short time since to the extent of \$3000, a loss which is fully covered by insurance. The warehouse was used for storing grindstones and unfinished shears.

Foster Brothers' Knife Works, at Oswego Falls, N. Y., were slightly damaged by fire on the 17th inst. The fire is supposed to have originated from smoldering sparks in the emery room. The prompt action of the fire department prevented what might have been a serious conflagration. The works are again in running order.

The Seabury Gun Company have been incorporated, with a capital of \$300,000. The company will manufacture arms of all descriptions in New York City. The incorporators are E. H. Litchfield, J. B. Grosvenor, H. Wallis and others.

The Scranton Axle Works, Scranton, Pa., have resumed operations after a brief suspension, which was rendered necessary in order to make needed repairs. Important improvements in the works are contemplated which will increase their output.

The Belmont Nail Works, Wheeling, W. Va., a part of the Wheeling Iron & Steel Company, started up on the 16th inst., after an idleness of five months and partial idleness of a year. They are giving employment to over 500 men.

The Gleeson Wire Cloth Mfg. Company have filed a certificate of incorporation in the Hudson County Clerk's office in Jersey City, N. J. The company propose to establish a factory at Harrison, N. J., for manufacturing wires of various patterns. The company will begin business with a capital of \$15,000. The incorporators are John Martin Moore of Kearney, George F. Wilson, Martin Desmond and Thomas F. Bulger of Harrison, N. J., and Francis A. Harris of Waterbury, Conn.

During the summer months extensive improvements and additions were made to the wire nail factory of the New Castle Wire Nail Company, at New Castle, Pa., whereby the capacity has been considerably increased. The plant of this concern is now in full operation and is turning out an average of 3200 kegs of wire nails every day. Since the initial establishment of this plant at New Castle it has been found necessary to increase the capacity from time to time in order that the firm could turn out their product as fast as wanted by the trade, and at this time their nails are sold in every part of the United States where wire nails are used.

The Standard Wire Company, New Castle, Pa., manufacturers of wire mats, report an excellent demand for their goods, and are operating their works to full capacity. Although this concern have been established but a short time, they have already built up quite a large trade, and propose in a short time to take up the manufacture of tree guards and other wire goods. The firm recently made a shipment of two of their flexible wire mats which measured 47½ feet in length and 6 feet in width. They have also received in the last few days a third order for a mat of this size, and are making shipments of the smaller sizes right along.

The Standard Horse Shoe Company, South Wareham, Mass., for whom Leeds, Robin-

son & Co., 4 Liberty street, Boston, are general agents, report that all their machines are being run full time. Improvements are going on at their plant, and additional new machines will be installed as soon as received from the makers. Their shoes are made from old horseshoes, insuring quality, and John Wike is patentee of the machines used and superintendent of the works.

E. T. Barnum, wire works, of Detroit, Mich., has just received an award upon steel prison jail cells or lockups and grocers' cheese safes, as well as upon his general exhibit at the World's Fair.

Miscellaneous.

The Providence Steam Engine Company are building two additional engines, each of 1100 horse-power, for the Union Company (electric railway) of Providence. These will be coupled direct to the dynamos. This company have made provision for engines and boilers of 7000 horse-power.

The plant of the Indianapolis, Ind., Steel Roofing Company has been damaged \$3000 by fire.

A. Leschen & Sons Rope Company of St. Louis, Mo., express themselves as being well satisfied with the volume of trade. Their trade for their Hercules wire rope is constantly on the increase, and judging from the inquiries received the company look for a good trade next year.

The C. & C. Electric Company's branch office in Philadelphia is now at 633 Arch street, in that city.

It is now thought that the Litchfield Car Works of Litchfield, Ill., which have been casting about for some time for a suitable location for a new plant, will settle at Memphis, Tenn.

Negotiations are in progress for the establishment of a brass foundry at St. Paul, Minn., by Jacob Kritch of Port Townsend, Wash.

The Cambridge Roofing Company, Cambridge, Ohio, have added numerous sheet metal specialties to their line of manufactures, which are principally iron and steel roofing, plain and corrugated. This company are now prepared to furnish eave trough, conductor pipe and all other material required to complete a metal roof.

A. B. Laurence of New York has furnished to the United States Government 4000 feet of Shultz Sable rawhide belting for the Watervliet Arsenal, West Troy, N. Y. The quantity required will aggregate about 4000 feet, with gross value of \$8000. A 24-inch belt has been in use there for some five or six years, and has recently been removed to the Springfield, Mass., Arsenal. On the Sun Insurance Company's dynamo there is one of the recently patented Shultz grooved dynamo belts, which is quite novel in method of reducing the much talked of air cushion. This is made with grooves running lengthwise of the belt.

A license to incorporate under the laws of Illinois has been issued to the R. Herschel Mfg Company, at Peoria; capital stock, \$30,000; to manufacture and sell mower knives, reapers, sickles, molding bits, coil springs, agricultural implements and supplies. Incorporators, Paul B. Herschel, H. R. Herschel, Martin Sohn and John Mertens.

It is expected that within a short time announcement will be made of the appointment of P. R. Dillon as general superintendent of the various plants of the Carnegie Steel Company, Limited, at Pittsburgh. These include the Edgar Thomson Steel Works, Homestead Steel Works, Duquesne Steel Works, Upper and Lower Union Mills and Beaver Falls Mills. It is probable that this appointment will result in other changes among minor officials being made.

The city of Indianapolis is said to be absolutely bankrupt. The new Controller in taking charge discovered that the cash resources of the city amounted to but \$2000 in hand, while an indebtedness of nearly \$900,000 falls due within six months. Steps are being taken to raise funds for necessary municipal expenses, particularly those of the approaching elections.

TRADE REPORT

The certainty that the purchasing clause of the Sherman bill will be repealed unconditionally has revived hope, and is received with satisfaction. Some authorities in the Iron trade expect an increased volume of orders and a more cheerful tone. Others believe that repeal now has simply saved us from additional disasters. It is probable that a good effect may be produced in another direction. There is evidence that during the protracted period of doubt over the fate of the silver question sales of Steel were made at very low prices for delivery very far into next year. Now that this danger is over a more conservative course may be followed.

Another question will come to the front which is expected to influence adversely developments in the Iron trade. There are many clear headed men engaged in the business who are convinced that nothing so radical in the way of tariff revision will be formulated by Congress that it will hurt the industry. A large majority of earnest and sincere persons, however, do believe that any change in the present rates of duty will do quick and lasting harm. Until it is known what those changes are to be their effect cannot be measured.

This broad statement may be made, so far as this winter's business is concerned, that no cut in rates likely to be passed will enable a buyer to purchase at lower prices than those now prevailing through the influence of fierce domestic competition at a time of unparalleled depression. As for the reflex action upon the Iron trade of disastrous effects upon other national industries, the case may be entirely different. It is remote, however, and should not affect perceptibly business which is pending or must come out for early settlement.

A little more work has come out lately in many directions, but it is far from being enough to put even a semblance of backbone into sellers. Some of the Rail mills have induced their customers to let them roll material for next year's delivery. Upon what terms this is being done has not transpired. It is evidently being done to keep the works organization together.

Until the money now accumulating so rapidly in our financial centers is again employed in commerce and industry no marked improvement can take place in those branches of the Iron trade which depend upon the railroads, upon engineering and municipal undertakings, upon buildings and upon the machinery branch for their customers. In many departments the busy season is practically over, and approaching spring can only bring relief. For a large section of the Iron trade the winter months seem bound to be dull. There seems little danger that another false start will be made.

While it is a matter of congratulation and rejoicing that we have escaped the perils which would have followed any compromise on the silver question, it must be remembered that confidence is a tender plant of slow growth. Unduly sanguine expectations of quick recovery now will only delay the day when the buyer will cease to be the autocrat. He is having his turn now, and is making the most of it, in some cases repudiating contracts in an unparalleled fashion.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 59 Dearborn street, CHICAGO, October 25, 1893.

Pig Iron.—The business of the past week has been of an irregular character. Some houses have been so fortunate as to capture a few good orders. One of these was for 1000 tons of local Coke and another for 500 tons. Ordinarily such transactions would not be considered of importance, but in the present condition of trade they are eminently worthy of mention. Business generally has been confined to carload orders, and even these have by no means been numerous. Inquiries are in the market for a couple of lots of 500 tons of Soft Southern Iron, and one inquiry is reported for 1000 tons of Lake Superior Charcoal. These inquiries are exciting more than usual attention from the trade, and competition for them promises to be lively. The sale of 2000 tons of Southern Gray Forge at \$10 at Cleveland has stirred up this market quite considerably, as it showed what possibilities are in store here. Quotations are now as follows for cash:

Lake Superior Charcoal.....	\$18.00 @	\$18.50
Local Coke Foundry, No. 1.....	13.50 @	14.00
Local Coke Foundry, No. 2.....	12.75 @	13.00
Local Coke Foundry, No. 3.....	12.25 @	12.75
Local Scotch.....	14.00 @	14.50
Ohio Strong Softeners No. 1.....	15.50 @	16.00
Southern Silvery, No. 1.....		14.50
Southern Silvery, No. 2.....		14.00
Southern Coke, No. 2.....	12.10 @	12.60
Southern Coke, No. 3.....	11.60 @	11.85
Southern, No. 1, Soft.....	12.35 @	12.60
Southern, No. 2, Soft.....	11.85 @	12.10
Southern Gray Forge.....	11.10 @	11.35
Tennessee Charcoal, No. 1.....	10.00 @	10.50
Alabama Car Wheel.....	18.50 @	18.75
Hocking Valley, No. 1.....	15.25 @	16.00
Jackson County Silvery.....	16.00 @	17.00

Bars.—Inquiries have been fair, and quite a number of sales are noted. Among these was one of 200 tons to a wagon manufacturer. The volume of business is less than that of two or three weeks since, but is still large enough to keep the local mills employed. Competition on business has reduced prices, and Common Bar Iron has been sold at 1.35¢, Chicago, although carloads bring more than this and may be quoted at 1.42½¢ @ 1.45¢, half extras, Chicago. Soft Steel Bars have participated in the weakness, and may now be had at 1.50¢ or lower. Jobbers note an improved demand from stock. Their business has of late come largely from Agricultural Implement manufacturers, some of whom are buying in this way as their wants require rather than place contracts with mills. Store prices on Iron are now 1.60¢ @ 1.70¢, and Soft Steel 1.65¢ @ 1.70¢.

Structural Material.—One fair contract for Beams has been placed for a new factory building. Small lots have been fairly active, but business in this line is now falling off with the approaching close of the building season. Bridge work is dull. Quotations are maintained at the following prices on mill shipments, Chicago delivery: Beams, 1.75¢ @ 1.90¢; Tees, 1.95¢ @ 2.05¢; Angles and Universal Plates, 1.75¢ @ 1.80¢.

Plates.—Almost nothing is doing in this line; an inquiry for 100 tons is extremely rare. The demand even for small lots from stock has fallen off. Mill shipments, Chicago delivery, are quoted as follows: Tank Steel, 1.75¢ @ 1.80¢; Shell Steel, 2¢ @ 2.10¢; Flange Steel, 2.15¢ @ 2.30¢; Fire Box, 2.75¢ @ 5¢. Store prices now prevail as follows: Iron or Steel Sheets, Nos. 10 to 14, 2.25¢ @ 2.40¢; Tank Steel, 2.10¢ @ 2.20¢; Shell Steel, 2.20¢ @ 2.40¢;

Flange Steel, 2.50¢ @ 2.65¢; Boiler Tubes, 70 %.

Sheets.—Trade in Black Sheets has been spasmodic. The mill business doing latterly has been almost entirely with jobbers, who have been buying as they needed stock, instead of as in former years placing time contracts. Mill shipments, Chicago delivery, are quoted at 2.75¢ for No. 27 Common. The demand for small lots from stock has been very good of late, but appears to be running more to Smooth Iron and Sheet Steel than Common Iron. The price on carloads of Common from stock is 2.90¢ @ 3¢. Galvanized Iron continues to be in good demand and prices are maintained at 75 % off for mill shipment with freight added. Copper Sheets are weaker and small lots are selling at 35 % off.

Merchant Steel.—Business in this line continues about as previously reported. New business is not coming forward to any considerable extent. The Joliet works of the Illinois Steel Company will be put in operation shortly after the beginning of next month on Billets, quite a number of orders having been entered at \$20. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery, Tire and Open Hearth Spring Steel at 1.90¢ @ 2¢; Ordinary Bessemer Machinery, 1.60¢ @ 1.65¢; Ordinary Bessemer Tire, 1.55¢ @ 1.60¢; Ordinary Tool Steel, 6¢ @ 7¢; Specials, 12¢ and upward.

Rails and Track Supplies.—It is reported that a contract for 2000 tons Steel Rails for a Western railroad was placed with Pittsburgh manufacturers, as the local mills would not start up to roll so small a quantity. Outside of this very little business has been offering either in standard or light sections. Standard sizes are unchanged at \$30 @ \$32; and Light Rails, \$31.50 @ \$32. Iron and Steel Splice Bars, 1.50¢ @ 1.55¢; Track Bolts with Hexagon Nuts, 2.50¢ @ 2.55¢; Spikes, 1.85¢ @ 1.90¢.

Old Rails and Car Wheels.—Transactions in Old Iron Rails are reported at \$14. Quite a number of railroads are still holding their stock of Old Rails, firmly refusing to take prevailing prices, but it is expected they will change their views by December, if not before that time. There will then be a desire as usual to secure as much cash as possible in anticipation of interest payments and the necessity of making up favorable annual reports. Sales of Old Steel Rails, selected lengths for re-rolling, have been made at \$10. Short pieces are quoted at \$7.50 @ \$8. The most vigorous inquiry fails to disclose any transactions in Old Car Wheels or negotiations on which to base a quotation.

Scrap.—A moderate volume of business is reported in almost every kind of Scrap Iron or Steel, for which there seems to be absolutely no demand whatever. Buyers of Scrap, however, are very conservative, and especially the foundries, who are taking only what they need from day to day, and will not anticipate their requirements to any extent. Dealers' selling prices, net ten, are as follows: No. 1 Forge, \$10.50; No. 1 Mill, \$8; Sheet Iron, \$5; Pipes and Flues, \$8; Axles, \$10; Horseshoes, \$11; Fish Plates, \$13; Spikes and Bolts, \$10; Cast Borings, \$5; Wrought Turnings, \$6.50; Axle Turnings, \$8; Heavy Cast, \$9.50; Stove Plate, \$7.75; Malleable Cast, \$8; Mixed Steel, \$7, gross ton; Leaf Steel, \$14 50.

Metals.—No trade is reported in Copper. In the absence of transactions carload lots of Lake continue to be quoted at 10½¢, and casting brands at 9½¢. Very little is doing in Spelter, which is down to 3 40¢. Consumers of Lead are holding off and business in that line has been extremely quiet, with quotations at 3 25¢ @ 3 30¢, according to quantity.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., October 24, 1893.

There is but little of interest to report from this center of the Iron trade, and taking the market as a whole no change of any moment can be noted. The trade recognize the fact that wear and tear is going on all the time, and that renewals will have to be made sooner or later, but as yet there is no indication of anything but a makeshift market. Anything that is not absolutely necessary is not bought, no matter how low the price may be, so that business continues on a smaller scale than for years past. After so many weeks of depression it would be pleasant to note a change for the better, but a strict adherence to facts will not permit anything of that kind. There is the same demand as there has been for several weeks past, no more, no less, and the same may be said in regard to prices. After so long a run of poor business and low prices the natural expectation is that there ought to be an improvement, particularly as the financial situation is becoming stronger, but while the future may be all right the present is to all intents and purposes just about as it has been for several weeks past.

Pig Iron.—The market is dull, listless and apathetic. Consumers appear to be absolutely indifferent in regard to the future course of the market. All they care to do is to provide for current requirements, leaving the future to take care of itself. There is a general assent to the statement that prices are not likely to be lower, but, on the other hand, there is no willingness to increase purchases, because there are no indications of an upward movement; hence they say: "What is the use of buying beyond what we require for immediate use?" Sellers find it impossible to make much headway on such a market, and are therefore taking such business as they can get at current quotations, or as near to it as may be. This in the aggregate is very trifling compared with any similar period during the past three or four years, notwithstanding the fact that prices are at the lowest ever known. To say that things will be better in a little while would be simply a guess, as there is nothing upon which to predicate any change whatever. Things can hardly be worse than they are, and we join with everybody else in the hope that they will soon be better, and that is about all that we feel warranted in saying. Sales are mostly at about the following quotations for Philadelphia or nearby deliveries, with occasional sales of round lots at 25¢ @ 50¢ less money: \$12 @ \$12.50, delivered, for standard brands of Gray Forge; \$13 @ \$13.50 for No. 2 Foundry, and \$14

@ \$14.50 for No. 1. Southern Irons can be had at less money, several lots having changed hands at \$11.50 @ \$11.75, with a fair chance that orders could be placed at the same figures for good sized lots and prompt settlements.

Steel Billets.—There is not much demand, but quotations are firmer, say \$20 @ \$20.25, delivered. A few small lots have been taken on this basis, but for 1000-ton lots and larger \$20 could probably be shaded to the right kind of a buyer. Mills are so poorly employed that they have comparatively little use for material, so that anything over 500-ton lots is rather exceptional these days. Last sale reported was 500 tons, a day or two ago, at \$20, to mill near by.

Finished Material.—The general report is that the demand is slow and disappointing, although in some cases mills are kept fully employed in meeting the current demand for small lots. This is exceptional, however, and the majority report a light demand at weak and unsatisfactory prices. There is no large work of any amount coming out, so that mills have to either run on old contracts (chiefly for shipyards) or such new business as can be had from day to day. Architectural work figures more prominently than almost anything else, but deliveries are so far ahead that it may be weeks before specifications will be sent in, so that, as we said before, there is little or nothing to depend on for immediate work except the daily run of small orders. This applies to all departments, Plates, Shapes, Sheets, Bars, everything, in fact, with no immediate prospect of anything better. Prices are very weak, and on anything attractive as to quantity, specification or delivery further concessions have been made, so that we may again say that new figures have been made, and lower than ever before. Ship Plate has been delivered from Pittsburgh to one of the Philadelphia shipyards at less than 1.55¢, and local mills have quoted about the same figure for Tank Steel. There is no price to anything, in fact, and to find how low the market really is it only needs the presentation of a nice specification of a good-sized lot and a firm offer. Small lots are quoted and usually sold at about the following figures:

Grooved Skelp, delivered.....	1.47½¢ @	1.50¢
Best Refined Bars.....	1.55¢ @	1.60¢
At interior points.....	1.50¢ @	1.55¢
Tank Steel.....	1.60¢ @	1.65¢
Heavy Plates.....	1.65¢ @	1.70¢
Shell.....	1.75¢ @	1.85¢
Flange.....	2.00¢ @	2.20¢

Old Material.—The market shows no improvement, and while prices are nominally unchanged, business is possible only when concessions are made. Some holders are not doing anything at all, on the ground that business at current prices is not worth handling. Nominal prices are about as follows:

No. 1 Wrought Scrap, delivered.....	\$12.00 @	\$13.00
Machinery Cast, delivered.....	10.00 @	11.00
Heavy Steel Scrap, delivered.....	13.00 @	14.00
Old Iron Rails, delivered.....	15.00 @	16.00
Old Street Rails, delivered.....	17.00 @	18.00
Wrought Turnings, delivered.....	10.00 @	11.00
Cast Borings, delivered.....	6.00 @	7.00
No. 2 Light Scrap.....	6.00 @	7.00

Edward Corning & Co. have removed their Philadelphia office from 237 South Third street to the Philadelphia Bank

Building, 421 Chestnut street. They announce that they are now ready to bid for all building work, either wrought, cast or ornamental. They will retain the agencies of the Allentown Rolling Mill Company and the Lebanon Iron Company, as heretofore.

St. Louis.

(By Telegraph.)

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, October 25, 1893.

Pig Iron.—Sales continue to be limited and prices are weaker. Some extremely low prices have been made which in ordinary times would have secured large orders, but it is doubtful if a cut of \$1 $\frac{1}{2}$ ton from current prices would have any effect on the size of an order. Consumers are buying only as they need the Iron, and some of them need very little. We quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry	\$13.25 @ \$13.50
Southern Coke, No. 2 Foundry	11.50 @ 11.75
Southern Coke, No. 3 Foundry	10.75 @ 10.95
Southern Gray Forge	10.25 @ 11.50
Southern Car Wheel	17.25 @ 18.25
Lake Superior Car Wheel	16.50 @ 17.00
Ohio Softeners	16.00 @ 16.50

Bar Iron.—There is no improvement in this department. Mills are only running part time, and it is more than likely will continue to do so during the balance of the year. Store trade is dull and prices are quoted a trifle lower than last reported. Lots from mill command 1.42 $\frac{1}{2}$ ¢ @ 1.47 $\frac{1}{2}$ ¢, f.o.b. cars East St. Louis. Jobbers ask 1.60¢ @ 1.65¢ for small lots from store.

Barb Wire.—There is no improvement to be noted in the demand for Barb Wire. Mills are making close prices and offering inducements in the way of 60 days, at prices that heretofore have been cash, but trade fails to respond. Jobbers are doing only a small business, and report a gradual weakening tendency in prices. We quote Painted from mill at \$1.90 @ \$1.95 in carload lots to jobbers. Galvanized at \$2.30 @ \$2.35. Jobbers ask \$2.05 @ \$2.10 for Painted, with the usual advance for Galvanized.

Wire Nails.—There continues to be a fair demand for Wire Nails, but prices are anything but encouraging. Some very low prices are reported, but are impossible to verify. Mills ask \$1.45 @ \$1.50 in carload lots to jobbers. Store price is \$1.55 @ \$1.60, according to quantity.

Rails and Track Supplies.—Business does not improve, and the demand continues to be of a hand to mouth character. Splice Bars, are quoted at 1.65¢ @ 1.70¢; Spikes, 2¢ @ 2.05¢; Bolts, Square Nuts, 2.50¢; with Hexagon Nuts, 2.60¢. Steel Rails continue to be quoted at \$30 @ \$31. Old Iron Rails are nominally quoted at \$15, but no sales are reported.

Pig Lead.—After selling down to 3¢, this metal has recovered somewhat and is now quoted at 3.10¢, although it is by no means steady at this figure. There is practically no consumptive demand.

Spelter.—This metal remains practically unchanged at 3.25¢ @ 3.30¢. Sales are limited to carload quantities.

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fifth and Main Sts.,
CINCINNATI, October 25, 1893.

There is no improvement in the market for Pig Iron, and as long as the obstructionists in the Senate are permitted to have their way there will be none. There has been little more than a current jobbing demand in this district, running from single carloads up to 200 tons for immediate shipment, but no buying for forward delivery, although the indications are that Pig Iron could be obtained at the rates now current for any delivery during the next four months. The occasional offering of some calamity Iron at prices less than the cost of production, although not in first hands, tends to keep up the demoralization of the market and to prevent any recuperation. There was one such lot of Gray Forge sold during the week and while the price was not made public it was intimated that it was as low as it sold during the most extreme depression. While the offerings of Southern Iron are not large or urgent, it is not difficult to obtain a sufficient quantity to meet the requirements of the market, for the demand from the East is smaller than it has been. The only industry that is melting any considerable quantity of Pig Iron is the Iron Pipe works, and it is not expected that this will keep up long. There is scarcely any demand for Charcoal Iron. Quotations are as follows:

Foundry.

Southern Coke, No. 1	\$12.75 @ \$13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel	17.00 @ 17.25
Malleable	17.00 @ 17.25

Forge.

Gray Forge	9.75 @ 10.00
Mottled Coke	9.50 @ 9.75

Pittsburgh.

(By Mail.)

Office of *The Iron Age*, Hamilton Building,
PITTSBURGH, October 24, 1893.

The situation to-day as compared with that of one week ago does not show any marked change one way or the other. The same struggle to get enough business to keep running still goes on, with the inevitable result of keeping prices as low as ever, and with buyers still able to secure concessions when they are prepared to place a moderate sized order with attractive terms.

Never before in the history of the Iron and Steel trades have producers been so completely at the mercy of buyers as they are now and have been for some time past. Contracts for Steel made when prices were from \$2 to \$3 $\frac{1}{2}$ ton higher than at present have been canceled and new contracts made, while the original seller looked on, unable to help himself. This also applies largely to almost every line of Iron and Steel manufactures. Had conditions been reversed the seller would have been called

upon to observe his contract to the letter, and it would seem that something should be done in the direction of more nearly equalizing this feature of the market by which the manufacturer would be better protected. For the week under review prices have shown no material change, but a general air of weakness pervades the entire market. Nearly all the mills in the Pittsburgh district are operating to greater or less degree, some of them to nearly full capacity, others to half capacity or less.

Pig Iron.—There has been no change in the condition of the market since our last report. Some Iron is being sold right along, but in small lots ranging from 100 to 500 tons. The probabilities of some business being done in Rails, if realized, will, of course, aid in reducing stocks to some extent. There is also more Steel being made now than there was last month, and it is safe to say that in the Pittsburgh district the consumption of Pig Iron has slightly increased over last month. If the present degree of activity among the mills is maintained, and there is no increase in production of Iron, it is not improbable that consumption may catch up with production within a short time, and when this has been attained there will undoubtedly be a better outlook for the Pig Iron trade. If buyers can be brought to realize that prices have reached bottom, we can then look for a better demand, which must come before there can be any betterment in prices. We repeat quotations of last week, as follows:

Neutral Gray Forge	\$10.50 @ \$10.75, cash
All-Ore Mill	10.75 @ 11.00 "
Bessemer Pig	11.25 @ 11.50 "
No. 1 Foundry	12.50 @ 13.00 "
No. 2 Foundry	11.50 @ 12.00 "

Billets.—There is nothing of special interest to report. The plants of the four Billet makers in this district are all in operation, and to nearly full capacity. There is a better inquiry for Steel now than a month ago, and the tonnage is considerably heavier. It is evident that Pittsburgh makers of Billets are on a more equitable basis as regards cost of production than ever before, and it is not believed that any one concern has any material advantage over his competitors in this respect. The market is represented by the quotation of \$17.75 at maker's mill. For a good sized order, with favorable terms of settlement, it is possible this price would be shaded to a slight extent. In all probability the new Bessemer plant of the National Tube Works Company, at McKeesport, will be started up about November 15 next. The plant has two 8-ton vessels, and is admirably equipped in every way. The product will be largely used by the above concern in the manufacture of Pipes and Tubes. Some good records for production are being made at the plant of the Shenango Valley Steel Company, at New Castle, the output being considerably larger than ever before.

Ferromanganese.—We continue nominal quotation of \$55 at mill for domestic. It is not improbable that this price would be shaded if there were any business offering.

Muck Bars.—There is nothing doing, and we repeat nominal quotation of \$20.50 at maker's mill.

Wire Rods.—We note a sale of 500 tons for prompt delivery at a price equal to \$26, cash, at maker's mill. For balance of the year delivery this price would be shaded perhaps 50¢ $\frac{1}{2}$ ton. There is a good demand for Rods, and some mills have very few to

offer for close delivery. The deal involving some 4000 tons referred to in our report of last week has not as yet been closed.

Steel Rails.—The local mill continues in operation and has secured an order for 500 tons of 85-pound Rails to be used on the Pittsburgh Division of the Baltimore & Ohio Railroad.

Plates.—Business is quiet, and the prospects for an increased tonnage are not encouraging. Prices continue low, and for good orders our quotations would no doubt be shaded. We quote as follows: Tank, 1.45¢ @ 1.50¢; Shell, 1.65¢ @ 1.70¢; Flange, 1.80¢; Fire Box, 2.50¢ @ 4.50¢, according to quality.

Structural Material.—The demand continues fairly good, everything considered, and as long as the weather will permit building operations to be carried on there will doubtless continue to be a moderate volume of business. The McIntosh-Verner Building, to be erected on Penn Avenue in this city, will require about 200 tons of material. It will be 120 feet front, 160 feet deep and eight stories high. We quote as follows: Beams up to 15 inches, 1.50¢ @ 1.60¢, according to order. Angles and Universal Plates, 1.60¢ @ 1.65¢; Tees, 1.75¢.

Bars.—Some of the mills have a fairly large amount of work on hand, while others have next to nothing. As yet there are no signs of the idle mills in the Mahoning Valley starting up. We quote Steel Bars at 1.35¢ at mill, with Bar Iron extras. Bars in the Valley are held at 1.35¢ @ 1.40¢, half extras, with reports that stocks at mills are badly broken, certain sizes being about cleaned up.

Merchant Steel.—Business is fairly active, and we are advised of a few season contracts being placed during the past week. Prices are being maintained on the following basis: Open Hearth Spring Steel, 1.90¢ @ 2¢; Bessemer Machinery, 1.65¢ @ 1.75¢; Toe Calk, 1.90¢ @ 2¢; Tool Steel from 5½¢ upward, according to quality.

Barb Wire.—The demand is only moderate, orders being confined nearly altogether to small lots. For ordinary carload lots we quote at \$2.25 @ \$2.30 for Four-Point Galvanized. Jobbers charge the smaller trade \$2.35 @ \$2.45 for less than carload lots. Painted is held at \$1.85 @ \$1.90, in carload lots.

Wire Nails.—We can report a very active demand for Wire Nails, several large orders for season requirements having been placed within the past week. Mills are fully employed, some of them having their product sold up into next month. Notwithstanding the active demand, prices show no signs of advancement. We quote at \$1.25 @ \$1.30 in carload lots, according to delivery. From the smaller trade \$1.35 @ \$1.40 is obtained. It is reliably reported that a movement is on foot among the Wire Nail trade looking to the taking of some action by which the severe competition coming from a certain maker will be removed or controlled.

Connellsville Coke.—For the week ending Saturday, October 14, there were 5375 ovens in the Connellsville region in blast, and 12,115 idle, with a total estimated production for the week of 48,460 tons. No new contracts or orders for Furnace Coke have been placed

for some time. While some Furnace Coke has been sold as low as \$1.10 per ton, certain operators state that as yet they have not been compelled to meet that price. It is probable, however, that an order placed in the market at this time would be accepted at that figure. Prices on Foundry Coke are maintained on the basis of \$1.50 to dealers and \$1.65 to consumers.

The offices of H. E. Collins & Co., Iron and Steel factors, Pittsburgh, Pa., formerly located on the seventh floor of the Bank of Commerce Building, in that city, have been removed to the third floor in the same building.

N. P. Hyndman of Pittsburgh has recently connected himself with Brown & Cochran, the well-known Connellsville Coke manufacturers, and will represent their Coke sales department in Pittsburgh in their new offices recently opened in the Conestoga Building, corner Wood and Water streets, in this city. The Connellsville Coke manufactured by Brown & Cochran has an excellent reputation among the trade, the concern being one of the oldest Coke producing firms in the Connellsville region. Mr. Hyndman will continue to represent the Hazard Mfg. Company of Wilkesbarre, Pa., manufacturers of wire rope, which agency he has held in Pittsburgh for the past 11 years. Mr. Hyndman recently closed a contract with the Pittsburgh & Castle Shannon Railroad Company for a 2-inch steel rope, weighing about 5½ tons, which will be placed on No. 1 plane of that concern.

Metal Market.

Copper.—Nothing has transpired in the way of new export or home trade movement that reflects any decided change in the condition of the market. Certain it is that fresh purchases have been on a moderate scale and that buyers are extremely indifferent, since deliveries on old contracts satisfy current wants to no small extent, while the offering affords something more than purely circumstantial evidence that the supply keeps fully abreast with the demand. A good showing is made in export statistics and the foreign markets have stiffened somewhat in the face of that fact, but Copper can be purchased as cheaply at present as at any previous time this month. Thus 9½¢ has become a common selling price for Lake Superior Ingot, while business is said to have been effected *sub rosa* at 9.70¢, regular terms, and at even less net cash terms, prompt shipment; about 250,000 lb were sold. With other varieties the experience has been somewhat similar, Electrolytic selling at 9½¢ @ 9¾¢ and common casting stock at 9½¢ @ 9¾¢, according to brand.

Pig Tin.—As far as recorded, the speculative dealings have been on a moderate scale and sentiment in the speculative direction seems to be exceedingly tame. Thus far this month less than 100 tons of Tin have been imported. According to most calculations nearly or quite 1000 tons have been turned out from first hands. The statistical position would thus appear to have undergone a further change for the better. It is the plain fact, however, that prices have averaged a shade lower, and that the movement of prices is rather inconsistent with the apparent relation of supply and demand, making altogether a peculiar market. Prices for deliveries this month and next have re-

ceded to 20.75¢ and December delivery commands little, if anything, more than 0.10¢ premium, despite estimates of a reduction of at least 1500 tons in spot stocks during the next six weeks. The best bids at the close for current and next month delivery were 20.70¢. There were sellers at 20.75¢ for October and 20.80¢ for November delivery at the close, with jobbing quantities offered at corresponding rates.

Pig Lead.—Nearly if not quite 1500 tons of common domestic have been sold at 3.30¢, delivered here or at common point during the balance of the year. The greater portion was taken by consumers, and not a little went from a prominent firm that purchased 1000 tons or more some time ago when values seemed to have been at a low ebb. Reports have had circulation that mining operations were checked to a greater or less extent by water difficulties; but latest accounts go to show that Idaho and other producers having modern machinery more than hold their own, and that several are in a position to work profitably at present prices, or, say, 3¢ @ 3.05¢ in East St. Louis. This fact is brought out in offset to "bullish" points that have been given more or less circulation of late, and seems to be deserving of more than passing attention. On Wednesday a sale was recorded on the Metal Exchange of 100 tons at 3.35¢, prompt shipment, cash against bill of lading.

Spelter.—There are faint signs that the market for this metal has reached hard pan. The most conspicuous of these is the fact that there are numerous orders for certain Western brands at 3.50¢, delivered here, for export account. It is learned also that the product of several smelters for the balance of the year has been sold up, and that bids of 3.55¢ have been refused in more instances than one. Any price under 3.60¢ for other than inferior brands seems to be exceptional at the moment, and there is not a great deal offered at that.

Antimony.—Demand has been of strictly routine character, and prices just about hold their own. We quote at 10¢ for Hallett's, 10½¢ for L. X., and 10¾¢ for Cookson's, in round lots.

Tin Plates.—Coke Plates have met with very fair sale, but the prices that were established about a week ago have not been maintained, for either spot stock or future shipments. In other varieties the movement has been slow and prices for the general line of Bright Charcoals and Ternes are somewhat uncertain, although showing no radical change. Spot quotations are as follows: Coke Tins—Penlan grade, IC, 14 x 20, \$5.30; J. B. grade, do., \$5.40; Bessemer full weight, \$5.35 @ \$5.40; light weights, \$4.92½ @ \$4.95 for 100 lb, \$4.85 for 95 lb, \$4.70 @ \$4.75 for 90 lb. Siemens Steel scarce. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60; Siemens Steel, IC basis, \$5.65; IX basis, \$6.75 @ \$7. Charcoals—Melyn grade, IC, \$6.35 @ \$6.37½; Crosses, \$8; Allaway grade, IC, \$5.60; Crosses, \$6.75; Grange grade, IC, \$5.75; Crosses, \$6.85. Charcoal Ternes—Worcester, 14 x 20, scarce; do., 20 x 28, \$11.35; M. F., 14 x 20, \$7.35; do., 20 x 28, \$14.75; Dean grade, 14 x 20, \$5.30 @ \$5.37½; do., 20 x 28, \$10.50 @ \$10.60; D. R. D. grade, 14 x 20, \$5.15; do., 20 x 28, \$10.10; Alyn, 14 x 20, \$5.32½ @ \$5.35; do., 20 x 28, \$10.40; Wasters—S. T. P. grade, 14 x 20, \$4.75; do., 20 x 28, \$9; Abercane grade, 14 x 20, \$4.60; do., 20 x 28, \$8.87½.

Financial.

The aspect of things financial shows far brighter at this time than could have been expected from the outlook a week ago. Then uncertainty and uneasiness ruled. The proceedings at Washington gave little promise of any speedy action by the Senate in the matter of repeal. Rumors of compromise were persistently published, and with considerable justification in fact. Last week a feeling of despondency was current which served to depress all business enterprise and speculation; and relief from the suspense seemed far off. Foreign exchange was high, and the money and stock markets dull and weak. The whole outlook was far from reassuring for any imminent improvement in the general monetary situation. Now, however, the scene has changed, and a decided feeling of hopefulness and reassurance has developed. The compromise scheme of Senator Gorman, which, it was announced, was likely to receive the support of a majority, has fallen through. The silver champions have surrendered at discretion, and all signs point to the likelihood of an early vote in the Senate, with an assured majority for immediate and unconditional repeal of the Silver Purchase law.

The sustained confidence of Wall street in the ultimate triumph of repeal—which now appears likely to be justified by the event—has done good service in staving off to a large extent the ill effects of the prolonged delay and inaction. Otherwise the suspense would probably have proved far more serious in its effects on the business community than it has been. As it is, with the silver repeal question in a fair way of satisfactory settlement, and confidence thereby restored, there is good hope for a gradual revival of business from this time forth. Foreign exchange, which has fluctuated with the varying prospects—favorable and otherwise—of currency legislation, is fast declining to the gold importing point, which will in all probability be shortly reached. Advances from Europe intimate that large sums of money are there awaiting American investment so soon as something decided is done to put our currency on a settled basis. Banks in this country are loaded with money for which they are seeking profitable investment, and everything points to activity and returning prosperity just so soon as solid ground is offered to encourage a general revival of business. Hopes are now entertained that this condition is already developing.

The accumulation of surplus funds by the New York banks goes on at a rapid rate. Saturday's statement of the Clearing House banks showed an increase in the reserves last week of \$8,744,000, bringing the surplus over legal requirements to more than \$42,500,000, the highest ratio reached since September, 1885. As at that period, however, the immense surplus merely reflected stagnancy in business and absence of demand for money for speculative purposes. The great gain of funds during the past week was made, moreover, in spite of large shipments of money from New York to the South for the purpose of moving the cotton crop. The figures subjoined show the principal items of Saturday's statement as compared with the corresponding dates of 1892 and 1891:

	October 24, '91.	October 22, '92.	October 21, '93.
Loans.....	\$405,602,400	\$452,333,900	\$394,037,700
Specie.....	82,210,100	70,649,300	95,718,500
Legal tenders.	34,281,200	49,904,400	52,344,000

Deposits..	416,400,600	460,885,100	421,686,900
Circulation.....	5,576,000	5,611,400	14,690,500

The following shows the relation between the total reserve and the total deposits at the respective dates:

Specie.....	\$82,210,100	\$70,649,300	\$95,718,500
Legal tenders.	34,281,200	49,904,400	52,344,000
Reserve.....	\$116,491,300	\$117,553,700	\$148,062,500
Reserve re- quired against deposits.	104,100,150	115,221,275	105,421,725
Surplus.....	\$12,391,150	\$2,332,425	\$42,640,775
Percent- age.....	27.9	25.5	35.1

In respect to the movement of currency and gold to and from the interior by the New York banks, the *Financial Chronicle* gives the following tables, which demonstrate clearly the extraordinary gain that is going on in receipts over shipments:

Week end- ing October 20, 1893.	Received by N. Y. banks.	Shipped by N. Y. banks.	Net inte- rior move- ment. Gain.
Currency.....	\$8,498,000	\$1,088,000	\$4,410,000
Gold	2,047,000	411,000	1,636,000

Total gold and legal tenders..	\$10,545,000	\$1,499,000	\$6,046,000
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Result with Sub-Treasury operations:

Week end- ing October 20, 1893.	Into banks.	Out of banks.	Net change in bank holdings. Gain.
Banks' inte- rior move- ment, as above.....	\$10,545,000	\$4,499,000	\$6,046,000
Sub-Treasury operations..	18,600,000	15,500,000	3,100,000

Total gold and legal tenders..	\$29,145,000	\$19,999,000	\$9,146,000
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New York Clearing House loan certificates outstanding have been reduced to less than \$2,000,000. As a set off to the plethora of money in the banks the Treasury statement issued on Saturday showed that the gold reserve has decreased to \$81,700,000 the lowest point it has ever reached. The loss for the first three weeks of the month of October reached \$12,000,000. It is believed, however, that the reserve will from henceforth gradually climb up again, as the currency now in process of redemption will become unlocked and available for use.

The customs receipts at New York for the first 20 days of this month aggregated \$5,038,000, as against \$6,942,000 for the corresponding period of last year. A proportionate decrease in customs receipts at other points throughout the country is shown by the reports received. The falling off of the revenues is clearly shown in the official statement that since the beginning of the present fiscal year the expenditures of the Treasury have exceeded the receipts \$22,000,000, which will be increased when October interest is taken out of the cash to the extent of \$27,000,000 or \$28,000,000. These figures bear out Secretary Carlisle's estimates that at the end of next June the deficit will amount to \$50,000,000 or \$60,000,000.

On the Stock Exchange a remarkable revival of trade has sprung up during the present week. Up to Saturday the volume of transactions was narrow, with a slight tendency to better prices, especially in the "grangers" and some of the less active railway stocks. On Monday a sensational rise took place in stocks of the anthracite coal roads, on the news of the acquisition of 40,000 shares of Lackawanna by W. K. Vanderbilt, with accompanying rumors of a coming change of ownership in that road, and a contemplated consolidation of the anthracite interests. Lacka-

wanna, which closed on Saturday at 160, rushed up as high as 171½, or 4 points higher than it reached during the McLeod boom of last year. Jersey Central jumped 10 points, and Delaware and Hudson 5 points. This was followed, however, on Tuesday, by a sensible reaction. Meanwhile the absolute significance of the Vanderbilt purchase is not fully known, but the feeling exists that its outcome will tend to improvement in the general status of the road, and to harmonize conflicting interests in the anthracite coal roads. Another feature of recent business in the Stock Exchange has been an advance, with considerable activity and strength, in Reading stock, consequent on the extension of the Speyer loan, referred to last week. Monday's market, in consequence of these and other favorable causes, was more active and buoyant than for many weeks, nearly all railroads and industrial securities sharing in the general rise. American Sugar certificates were especially active, both on that day and on Tuesday, rising rapidly until 104½ was reached, the highest point yet touched by this stock, but dropping suddenly again to 99½. Late on Tuesday the news of the surrender of the anti-repealers at Washington and good prospects of prompt action in the Senate gave added buoyancy to the stock market, which closed strong, with values enhanced along nearly the whole list of stocks. The following list shows the extreme fluctuations of the more active securities during the past week, with closing quotations on October 25:

	High- est.	Low- est.	Closing, Oct. 25.
Am. Sugar Ref.....	104½	91½	103½
Atchison, T. & S. Fé....	21½	18½	21½
Balt. & Ohio.....	73½	67½	73½
Chicago Gas.....	64½	58½	63½
Chic., B. & Q.....	86½	78½	86½
Chic., Mil. & St. Paul..	64½	58½	64½
Chic., Rock Isl. & Pac..	70	61½	70
Del. & Hudson.....	130	121	129½
Del., Lack & Western....	171½	156	164½
Gen. Electric.....	49½	43½	49½
Lake Shore.....	129	121½	129
Louisville & Nashville..	49½	44½	49
Manhattan.....	134	126½	133
Missouri Pacific.....	25½	21½	25½
Minnesota Iron, asked..			60
National Lead, Common.	28½	25½	28½
New Jersey Central.....	119½	110½	117½
New York Central.....	104	103½	103½
N. Y., L. E. & Western.	17½	13½	17½
Northern Pacific, Pfd..	24½	22	24½
Philadelphia & Reading..	23½	17½	23½
Richmond & West Pt.,			
Term.....	3½	2½	3½
St. Paul & Omaha.....	37½	34½	37½
Union Pacific.....	20	17½	19½
Western Union.....	90½	81½	90½

Money on call has ruled exceedingly low; rates having been quoted largely at 1%. The usual rate has, however, been about 2%, which was the closing price on Wednesday. The supply of call loans is abundant, but the demand hitherto has been but moderate. Time money is quoted at 4% for 30 days, 4½% for 60 @ 90 days, and 5% @ 6% for longer periods. Banks have not lately been in this market, such transactions as have been consummated being generally with trust companies or private lenders. Mercantile paper has shown some slight movement, and a fair out of town business is reported at about the following rates: 5½% @ 6% for prime indorsed bills, 6½% @ 7½% for first class single names, 8% @ 10% for other names less well known.

Sterling exchange, has ruled weak and lower. The demand for remittances is slight, while the supply of bills is large. Last actual business was done at the following rates: Bankers' 60-day bills at \$4.80½ @ \$4.82; demand at \$4.83 @ \$4.84; cables at \$4.83½ @

\$4.84½; 60-day commercial, \$4.79 ½ @ \$4.80; demand at \$4.83½ @ \$4.85½. Domestic exchange on New York is quoted as follows: New Orleans, commercial 150 @ 175 discount, bank par; Charleston, buying ½ discount, selling par; San Francisco, sight 15; telegraph 25 premium; Savannah, buying ½ discount, selling ½ discount @ par; Chicago, 75 premium.

The market for Government bonds is strong and practically higher. Closing quotations were as follows:

	Bid.	Asked.
2s, 1891, registered.....	97	111½
4s, registered.....	111	111½
4s, coupon.....	111	111½

Silver has strengthened; the closing price for bars in London being quoted at 33½ d. ½ ounce, and in New York at 74¢ ½ ounce.

New York.

Office of *The Iron Age*, 96-102 Reade street, {
New York, October 25, 1893.

Pig Iron.—Buyers are taking Iron only for immediate requirements, and the market continues very dull. We quote Northern brands \$14 @ \$15 for No. 1; \$13 @ \$14.25 for No. 2; \$12 25 @ \$12 50 for Gray Forge, at tidewater. Southern Iron, same delivery, \$13.25 @ \$14.25 for No. 1; \$12.25 @ \$13.25 for No. 2; \$11.50 @ \$12.25 for No. 3; \$11.75 @ \$12.25 for No. 2 Soft, and \$12.25 @ \$12.50 for No. 1 Soft. Gray Forge is \$11.25 @ \$12.

Spiegeleisen and Ferromanganese.—There is only a very moderate demand for small lots of Ferromanganese. We quote: Foreign Spiegeleisen, nominally, for 10 % @ 12 %, \$21.50 @ \$22, and 20 % \$25 50 @ \$26, on cars, Jersey City, and Ferromanganese, \$55 50 @ \$56.

Billets and Rods.—Business in domestic Billets is very light. In Wire Rods a sale has been made of a moderate lot by a Western mill. We quote nominally: Domestic Billets, \$20.50 @ \$22.50, and foreign Billets, \$28 @ \$28.50, tidewater; domestic Wire Rods, \$28.75 @ \$29, and foreign Rods, \$39.50 @ \$40, tidewater.

Steel Rails.—Eastern mills report no new business. Rumors of a sharp cut are persistently circulated, but are without tangible foundation.

Track Material.—Small lots are selling at the following prices: Spikes, 1.80¢ @ 1.90¢; Fish Plates, 1.40¢ @ 1.60¢; Track Bolts, Square Nuts, 2.25¢ @ 2.40¢, and Hexagon Nuts, 2.40¢ @ 2.50¢, delivered. Concessions would be made for round lots.

Manufactured Iron and Steel.—A moderate sized order is about to be placed for a new city hall at Paterson. A prominent dry goods house in this city is also expected in the market soon for an extension. In engineering work a 1500-ton order is on the market for Buffalo. Plates are very dull, and some low quotations are being made. We quote nominally: Beams up to 15-inch, 1.75¢ @ 2¢; 20-inch, 2¢ @ 2.25¢, for round lots; Angles, 1.75¢ @ 1.90¢; Universal Mill Plates, 1.65¢ @ 1.90¢; Tees, 2¢ @ 2.15¢; Channels, 1.80¢ @ 2¢, on dock. Steel Plates are 1.60¢ @ 1.70¢ for Tank; 1.75¢ @ 1.90¢ for Shell; 2¢ @ 2.15¢ for Flange, and 2.50¢ @ 2.80¢ for Fire Box, on dock; Refined Bars are 1.50¢ @ 1.9¢, on dock, and Common, 1.40¢ @ 1.50¢; Soft Steel Bars are 1.50¢ @ 1.70¢; Scrap Axles are quotable at 1.70¢ @ 2¢, delivered; Steel Axles, 1.70¢ @ 1.90¢, and Links and Pins, 1.70¢ @ 1.80¢; Steel Hoops,

1.75¢ @ 1.90¢, delivered; Cotton Ties, 70¢ @ 72½¢ @ 45 lb bundle, at mill.

Old Material.—Steel Works Scrap is selling at very low figures, \$10.50 @ \$12, delivered, being done. Old Iron Rails are nominally at \$13 @ \$14; Old Steel Rails, \$8 @ \$9, and Wrought Scrap \$9 @ \$11.

British Iron and Metal Markets.

[Special Cable Dispatch to *The Iron Age*.]

LONDON, WEDNESDAY, October 25, 1893.

Business in Pig Tin has been confined chiefly to regular dealers. Reduction in Straits shipments fails to attract outside interest and consumers buy sparingly. The leading holders offer with some reserve, however, and prices vary in a moderate degree only, despite the dullness of trade. The average has been slightly higher than that of last week, with late transactions at £78. 10/ for prompt delivery and £79 for three months' futures.

Copper has ruled a fraction higher in the face of slow business and other adverse influences. The chief obstacle in the way of improvement is periodical selling orders from the American market. Orders from consumers have been readily filled at market value. Prices at the close were £42. 5/ for Merchant Bars, prompt delivery, £42. 12/6 for three months' futures, and £45. 10/ for Best Selected English.

Tin Plate orders have been moderate and the market is weaker, with some pressure to sell. Ordinary 14 x 20 Bessemer Cokes went at 10/9, f.o.b. Swansea, early in the week, but some orders were subsequently placed at 10/6. Demand for Oil s'izes has moderated. Stocks at Swansea are estimated at 226,000 boxes. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....	12/9 @ 13/3
IC Bessemer Steel, Coke finish.....	11/6 @ 11/9
IC Siemens.....	11/9 @ 12/
IC Coke, B. V. grade, 14 x 20.....	11/6 @ 11/9
Charcoal Terne, Dean grade.....	11/3 @ 11/6

Pig Lead has been very quiet, and prices have remained at £9. 12/6 for Soft Spanish.

Spelter has remained steady in price at £16. 15/ for ordinary Silesian, but found rather slow sale.

All branches of the Iron and Steel trade remain flat, with prices soft but showing no radical change. Last dealings in warrants were at 42/3 for Scotch, 34/6 @ 34/7½ for Cleveland, and 44/6 for Hematite.

From Pittsburgh comes the information that the vote of the lodges of the Amalgamated Association on the question of granting a reduction of 10 per cent. to the sheet manufacturers will not be concluded before the latter part of this week. In the meantime the members of the Association of Iron and Steel Sheet Manufacturers, believing that the vote will be against accepting the reduction, have arranged to hold a meeting in the *Times* Building, Pittsburgh, on Thursday, the 26th inst. At this meeting it is expected that important action on the request for a re-

duction will be taken. In case the workmen refuse to adjust the wage scale governing sheet mills adopted in Pittsburgh last summer to conform to the recent reduction in the base of the bar and guide mill scales from 2 cents to 1½ cents, it is not improbable that the sheet manufacturers, who have heretofore recognized the Amalgamated Association, will refuse to longer treat with that organization and will operate their mills with non-union workmen. Should this action become necessary it will be a very serious blow to the Amalgamated Association, as what little strength that organization retains lies nearly altogether with the sheet manufacturers. The final outcome of this matter is being awaited with considerable interest by the trades.

Industrial Matters in Ohio.

The actual condition of affairs is dull, and there are many thousand workmen throughout the State either idle or only working part time. Blast furnaces are out of blast, bar mills and guide mills are nearly all idle, boiler shops, machine shops, foundries and miscellaneous factories would not in the aggregate average half time. The holiday and stock taking season is approaching, and the vision of hard times will soon become a reality. There is only one branch of the iron and steel trade in which any activity is noticed. Sheet mills are able to continue operations, but in all other branches operations are nearly at a standstill, the cause being unremunerative prices and an incompatible wages scale. In spite of these facts, however, the sheet mill skilled workers have cast their votes through their various lodges, and have refused to agree to a reduction of 10 per cent. in their wages simply because the scale was signed for a year and they want their "pound of flesh." What the immediate result will be is difficult to predict, as the mills which are in operation are all working on orders for prompt shipment, and do not care to disappoint their best customers, but as soon as present wants are supplied the battle may begin in earnest. Orders now entered have been accepted only after the closest scrutiny in regard to the credit of the buyer, and there is no attempt to force goods. The bulk of business being done is in galvanized sheets, and mills that are able to make up mixed cars of black and galvanized are getting preference from the best buyers. The slight activity is not to be compared with the rush for material felt at this season for many years past, and when it is over the workmen will probably realize that they have made a mistake. It is safe to say that no stocks will be accumulated this winter at the mills, although such has been the course in former years. The ultimate result may be local agreements on a non-union basis, as indicated in *The Iron Age* two weeks ago, and nothing but a conciliatory spirit on the part of the workmen can prevent it. The manufacturers are independent in their attitude toward buyers for the reason that they are not over anxious to run their plants, and they are ready to act in the same manner toward the men when occasion requires. The iron and steel roofing trade is particularly dull this fall, and the average time made by the 23 concerns doing business in the State is not more than three days per week. Traveling men are nearly all at home for the rest of the season.

HARDWARE.

Condition of Trade.

ORDERS continue comparatively small and cover in most cases assortments simply for the replenishing of stock, seasonable goods having also a prominent place. Anticipating a quiet trade for the next two or three months, the large wholesale houses are buying very sparingly, preferring to let their stocks become considerably depleted rather than be obliged to carry over a considerable quantity of goods. They are also giving continued attention to the matter of credits, and are exceedingly careful in this regard, and disposed to restrict the time which accounts are permitted to run, limiting the transactions largely to a cash basis. In order to dispose of the stock on hand there is also a tendency on the jobbers' part toward cut prices on a good many lines, and more or less irregularity is thus caused. Prices, however, are pretty well maintained, and while there are cases in which manufacturers would undoubtedly accept lower prices on attractive orders, there has been on the whole a remarkable steadiness in values. Collections are unquestionably better, but a good deal of complaint is still made on this score. There is no reason to doubt that business during the past month or two has been seriously injured by the delay in the repeal of the Sherman bill, but it is expected that early action in this direction will have a beneficial effect on the general condition of trade.

Chicago.

(By Telegraph.)

The Shelf Hardware trade is in about the same condition as reported last week. The volume of business shows a decided falling off from its condition during the first half of October. Merchants throughout the Northwest have evidently filled up on season goods, and orders now coming in are only for small lots of Hardware, merely to cover present requirements. Stocks are reported by salesmen to be extremely light in every direction, but merchants are still disinclined to buy anything more than they must get for their immediate trade. The outlook is quite discouraging for the jobbing trade here for

the balance of the year. Economies are being instituted so as to reduce expenses as much as possible to correspond with the shrinkage in business. The prices on Hardware generally are remarkably steady considering the circumstances. Tin and Tinware are especially noticeable in this respect, which is perhaps due to everybody carrying very light stocks. Heavy Hardware is in a somewhat better condition than Shelf Hardware, owing to the continued good trade in the iron and steel departments. The other departments, however, are quiet, as wagon and carriage makers are still buying very lightly.

St. Louis.

(By Telegraph.)

There is no particular change in the Hardware trade since our last report, except, perhaps, that prices are not as firmly held. Here and there low prices for special lots are made, which rapidly become regular selling prices, and a lower range all around is the natural result. Wire Nails just now seem to be the special victim, and we hear of some exceptionally low prices, which if even thought of three months ago would have appeared more than ridiculous. Jobbers and retail dealers alike are not carrying anything like their usual stock or assortment, and refuse to change this policy until something definite is done in Washington. A waiting policy is being adopted, and under the circumstances seems the only correct one to adopt.

Notes on Prices.

Wire Nails.—The volume of business is rather light, and comparatively few of the mills are running on full time. There have been some inquiries in regard to quotations on especially large lots, and it is understood that low figures have thus been developed. The market on the whole is represented by \$1.30 for carload lots at mill, this figure being readily obtainable, though some manufacturers quote a slightly higher price.

Chicago, by Telegraph.—The trade in Wire Nails tapered off during the past week, the early part having been fairly active, but it has as yet not relapsed into complete stagnation, as there are some inquiries from large buyers for considerable quantities which are expected to lead to further business. Prices have receded on factory lots and some sales were made as low as \$1.32½, Chicago, although \$1.35 to \$1.40 are now considered fair quotations. Job-

bers have recently had an improved business in Wire Nails and have taken a great many orders, but usually for small quantities. Their regular price from stock is \$1.50, but this is shaded by some houses.

Cut Nails.—There has been little change in the Cut Nail market since our last review. The quotation of \$1 base is regularly and quite firmly adhered to. There is evidence of a disposition on the part of the mills to obtain a slight advance, but it is not attended with much success. The volume of business is not sufficient to justify the running of the mills to their full capacity, and at the present time considerably less than the usual quantity of Nails are being made in the Wheeling district, and the Eastern mills seem to be doing a somewhat larger proportion of the business than usual. The New York price for small lots from store is \$1.20 to \$1.30.

Chicago, by Telegraph.—The trade in Cut Steel Nails has been for some time moving in spurts, being fairly active for a few days and followed by a period of dullness. The net result, however, is such as to keep the local factories steadily at work. A change has recently been noted in the character of this trade which seems to have some significance. A great deal more business is now being done in Finishing, Casing and Clinch Nails, which was a branch of the trade that for a considerable period seemed to have been completely monopolized by Wire Nails. The Cut Nail manufacturers are hoping that this may prove that a reaction has taken place, but would like to see some further demonstrations before allowing themselves to derive very much encouragement. Prices are maintained at \$1.20 to \$1.25, Chicago, for factory lots. Small lots from stock are held at \$1.30.

Barb Wire.—The Barb Wire market is stagnant and in an unsettled condition. Prices are decidedly in buyers' favor, and with the small volume of business doing are uneven and irregular. We quote Galvanized Four-Point at mill on a basis of \$2.25 to \$2.30. Painted being held at 40 cents less, but concessions from these figures are obtainable.

Chicago, by Telegraph.—Manufacturers report only a moderate trade. This is derived in a large measure from direct connection with the retail merchants. It is difficult to obtain quotations as trade is now going, as prices made depend entirely on circumstances.

Manufacturers of ordinary Galvanized Barb Wire are selling at \$2.40, but this is shaded. Jobbers continue to quote small lots from stock at \$2.55, but say that their trade in this line is practically dead.

Clippers.—We are advised by the Coates Clipper Mfg. Company, Worcester, Mass., that only 20 per cent. discount is allowed on their power machines and parts for the same, instead of 25 per cent. discount, as stated in our issue of October 19, 1893, under Notes on Prices. With the exception of power machines and parts their line of Clippers is subject to a discount of 25 per cent.

Combined Door Lock and Ventilator.—This article was described in our last issue as put on the market by the Brooklyn Specialty Company, 166 Pierrepont street, Brooklyn, N. Y. It is sold to the trade, japanned, at \$3 per dozen, net, and nickel plated at \$5 per dozen, net.

Magnetic Curry Comb.—The Ives Mfg. Company, North Granville, N. Y., who are manufacturing this article, which was illustrated in *The Iron Age* October 12, are selling the Comb to the retail trade at \$2 per dozen, net.

Cream City Flour Bin and Sifter.—This article is put on the market by the Geuder & Paeschke Mfg. Company, Milwaukee, Wis., and was described in a recent issue. It is sold from the following list, which is subject to a discount of 50 per cent. to the trade:

25	50	100 pounds.
\$34.00	\$42.00	\$54.00 per doz.

Automatic Steam Coffee Cooker.—This Cooker was described in our last issue and is put on the market by Wilmot Castle & Co., Rochester, N. Y. It is sold to the trade from the following list, which is subject to a discount of 40 per cent.:

2-qt. heavy tin,	\$1.50	...nickeled pots,	\$2.00
3 " " "	1.75	" " "	2.50
5 " " "	2.50	" " "	3.50

Cereal Kettles for use in connection with the above steamers are sold at 20, 25 and 30 cents respectively.

The Arnold Automatic Steam Cooker, put on the market by the same concern, is sold to the trade from the following list, which is subject also to a discount of 40 per cent.:

No. 0, Two quarts,	1 compartment,	\$1.50
No. 1, One gallon,	" "	2.25
No. 2, Two gallons,	2 compartments,	2.75
No. 3, Three gallons,	" "	3.50
No. 3, Three gallons,	3 " "	3.75
No. 4, Four gallons,	3 " "	4.50
No. 5, Five gallons,	3 " "	5.00
No. 5, Five " oval,	3 " "	6.00

Glass.—Since our last report the Glass market has been declared an open one by the National Window Glass Company; that is, the agreement among American manufacturers to sell Glass at only fixed prices has been abandoned. The Glass factories will start up when and as they please, so it will be a free fight and no favor. The National Window Glass Company did not give up their charter, but for the present will not influence the manufacturers

nor the trade. The wage question has not yet been definitely settled, but indications are that an agreement will be reached in a short time. It is estimated that 75 per cent. of the factories will be started up in the near future, but it remains to be seen how large a proportion of those starting can continue running, with light demand, accumulating stocks and low prices. Former quotations are still being adhered to, as no new Glass can be got on the market under three or four weeks, by which time the fall demand will practically be over. In Plate Glass there is little doing. Imported Glass is being sold in a small way, as the market continues lifeless.

Export Notes.

PAUL F. GERHARD & CO., 19 Whitehall street, freight agents of the Lamport & Holt line of steamers to Rio de Janeiro, recently inaugurated, have issued a special notice, announcing to shippers that owing to the increased expense in landing cargo in Brazil, by reason of the present disturbed state of the country, they have been obliged to advance all rates of freight 20 per cent. to Rio de Janeiro.

Roland R. Dennis, in charge of Whitman & Barnes Mfg. Company's London branch, has returned to England after a

Door Hinges," and "Spring Locks." Desk and cabinet cards for document boxes are also shown, made in the same manner. These are all made with their Wilson white paper letters on black gummed paper, which can be easily moistened and attached to a drawer or box. Labels are made with any wording desired, at 50 cents per dozen labels. A recently issued catalogue of merchants' specialties, shows these labels; also a large variety of tickets, tags, labels, &c.

World's Fair Exhibits.

ATLAS TACK CORPORATION.

The arrangement of Tacks, Nails, Eyelets, Rivets, Staples, &c., by the Atlas Tack Corporation, Boston, makes an attractive and effective display. A large canvas is mounted on a richly carved frame which stands on a raised inclosed platform. On the canvas is painted one of the mills of the A. Field & Sons branch of the corporation, with a title scroll and list of specialties; also the addresses of the various corporation branches. On the reverse side of the canvas panel is an eagle surrounded by the stars and accompanied by the shield and flag; while beneath is the title of A. Field & Sons, with the description of the specialties produced at their works, all done in letters formed by copper and iron Tacks, carpet, brush and gimp Tacks, patent coated Tacks, &c., the color effects being created by the use of the various colored Tacks. The panel represents, it is stated, the

KNOBBS & LOCKS

Drawer Label.

three weeks' visit here. He came over to attend a managers' meeting, which was held at Akron, Ohio, September 18, at which all the branch houses were represented.

The Central & South American Telegraph Company, 37 Wall street, New York, have issued a handsome mounted wall map, 39 x 37 inches in size, for the accommodation of their patrons, which shows at a glance not only the location of their own cables, but those of other companies connecting North and South America, as well as the numerous submarine lines to Europe. Commencing at Galveston, the various points reached by them in Mexico, Central America and the West Coast ports of South America, together with their transcontinental line from Valparaiso to Buenos Ayres, are given, in connection with the land lines of both continents. These features are represented on a hemisphere 30 inches in diameter, resting on a blue background.

Drawer Labels.

THE TABLET & TICKET COMPANY, 99 Franklin street, New York, and 87-89 Franklin street, Chicago, who make a specialty of Wilson's Gummed Letters and Figures, are offering a line of Drawer Labels, one style of which is represented in the accompanying cut. Other labels are shown, with variously designed backgrounds and different sizes of letters, and readings as follows: "Yale, Small Brass;" "Brass Screws, One Inch;" "No. 6

six months' continuous work of one person. Surrounding the panel are uniform showcases containing a series of trays divided into compartments in which are displayed the many colored Tacks, &c. It is remarked that the exhibit includes over 2000 sizes of carpet, upholstery, leather and silk covered Tacks, brass Nails and Buttons, Staples, double pointed Tacks, Eyelets and Rivets, Brads, Nails, Escutcheon Pins, Tufting Buttons, Tufting Nails, &c., the Tacks measuring from $\frac{1}{8}$ inch up through and including all the standard sizes.

NATIONAL CASH REGISTER COMPANY.

The National Cash Register Company, Dayton, Ohio, have three exhibits at the fair—one upstairs in the Department of Liberal Arts, another in the Electrical Building and a third in Machinery Hall. The exhibit in the Electrical Building is in a pavilion, at the left of which is a Total Adding Register, having on the top a number of metal signs, two of them being exhibited at a time, and automatically changing about every half minute. Two of the keys of the register are operated to show the public how the registers work. The interior mechanism of the machine is exposed, showing the method of adding. On the other side is a gold plated check printing register, which is also worked automatically. At short intervals the register prints, cuts off and throws a check out, on which is printing, showing the amount of the purchase, the date, the number of the check, &c. The register has an illumi-

nated sign on top which flashes out at frequent intervals. In the center of the pavilion is a glass picture, illuminated with a light at the back, showing a view of the envelope addressing department at the factory, with operators at work. On the opposite side of the pavilion is another illuminated picture in colors of their factory at Dayton, showing a scene at night with all the windows lit up. Employees of the company are in attendance to explain the merits of the registers. At the Machinery Hall exhibit registers are displayed on counters in a booth finished in cream and gold. Attendants are here kept busy explaining the workings of the machines, and at all the exhibits the public is invited to touch and operate the registers. In addition to the exhibits there are over 650 National Cash Registers used by the World's Fair, the collection department having adopted them to control and account for the cash received. These are found on the Midway Plaisance, in the German village, Esquimaux village and elsewhere. We are advised that foreigners soon learned to operate the registers.

Changing a Credit into a Cash Business.

BY E. D. WARNER.

THAT A BUSINESS upon strictly a cash basis is preferable to one part cash and part credit, or to one all credit, is conceded by all progressive merchants. But while the theory and desirability are granted, the practicability is doubted—in fact, even derided. To a merchant starting a new business, to open and continue an all-cash trade, is comparatively a simple matter; the rub comes upon changing a credit into a cash business.

CAN IT BE DONE

without injury to my business? Most emphatically yes, if one has push, patience and perseverance, but if one be weak and vacillating, then a negative answer must be given. While the beginning may be marked by a decrease in the amount of sales, yet the net profits will usually be found to be as great, if not greater, than before; for in a part cash and part credit business three-fourths of the profits will result from the cash part. A large share of the items of expense, if examined carefully, will be found to consist of matters relating largely to the credit side of the ledger, such as bad debts, book-keeper, cost of collection, extra help required, interest on capital invested and a number of other charges traceable to the same cause. In a cash business these are eliminated, while added sources of profit we have cash discounts, increased custom because of lower prices, quick returns upon compound interest of money invested and the freedom from that peace destroyer, worry. Besides, one has his business well in hand, is ever pushing it, and with a gilt-edge credit—the best of capital.

LESSENERED SALES.

Without doubt the first year or two will see lessened sales, but remember it is but the shrinkage from inflation to

real value and that the growth afterward will be more healthy and satisfactory than it ever otherwise could be.

The end is desirable, but how is it to be obtained?

In the first place, decide to change to a cash basis and do it. Do as Cortez did when entering Mexico with but a handful of men against a rich and powerful nation—burn your boats behind you and press on with a firm determination to succeed, and you will. Set a day for the change, and prepare your customers for it by explaining to them as far as possible, either personally or by letter when well acquainted, by circular, as we did, or through the press, the advantages to be derived therefrom by yourself, but especially by them.

When we decided to make the change to a cash basis we issued a circular, which was distributed among our customers, as follows:

We take pleasure in announcing to our friends and the public generally that after this date we propose to conduct our business, both buying and selling, on the cash plan.

A long experience in the Hardware business has convinced us that the system of selling goods on credit, to be paid for when convenient, is a most vicious one. The increased expenses of doing a credit business, on account of salaries of bookkeeper and collector, the amount of inevitable losses every year because of bad debts, which will occur notwithstanding the most careful discrimination, and the loss of interest from having a large amount of capital "tied up" in book accounts, all render necessary a larger margin of profit, which has to be considered as business expenses and paid for by the cash buyers.

Besides this, the bad feeling constantly occurring because credit is given to one customer and refused another, and the disagreeable necessity of being obliged to "dun" customers for past due accounts, confirm us in our determination in the future to sell for cash.

In these times of close competition cash buyers expect, and are entitled to, the very lowest prices, and should not be required to pay the losses incident to a credit business.

In the future it shall be our aim, by giving the most careful personal attention to every detail of our business, to satisfy the demands of close cash buyers, and to carry a still better assortment of carefully selected lines of the following goods. Endeavoring in all things to further the interest of our patrons by giving them all the advantages of a cash system, we shall hope to merit a continuance of the patronage which we have received in the past.

On the other side of the circular we called attention to the fact that we carry in stock a large and complete assortment of the following goods, purchased direct from the manufacturers for cash. The various lines of goods were mentioned under the following headings:

BUILDERS' HARDWARE.
CUTLERY.
MECHANICS' TOOLS.
BUTCHERS' SUPPLIES.
BLACKSMITHS' GOODS.
FARMING IMPLEMENTS.
HOUSE-FURNISHING GOODS.
MANUFACTURERS' SUPPLIES.

Show by your prices how much cheaper you can sell now than before, as you surely can. It is unnecessary to make a pro rata reduction through your stock, but make leaders many and often, display tastefully, advertise extensively and trade will be attracted. This now can be done with no fear of loss. Upon those articles where competition is severe figure very low, for here comparisons will be made; but from those unattacked a good profit can be reaped. In the first case, however, good returns will be obtained because the stock is quickly turned into money and reinvested, the interest or profit being now compound instead of simple.

FOR CASH.

One, except in special cases, can always sell for cash closer than for credit, and in this way is able to make greater inducements to the public to trade with him than can his credit competitor. Without doubt a few customers will become offended when refused trust, but for every one thus lost two will be gained, and as the firms see that their money will go further for cash than when time is given they will soon return. A man if he thinks he has saved money upon an article of good quality will be pleased. Such a customer is the best advertisement one can have. Sell close at a fixed price, back it up by strict honesty and courtesy, and there will be no doubt of your success.

IN CHANGING

to a cash basis, to get the best results most quickly, circumstances will alter cases. With a wide fund to draw from the change can be made at once, but when restricted it is often better to allow, for convenience, a little time to those you know will pay your bill as soon as presented. They will, however, soon become educated to paying cash. But let the time given be brief as possible.

Our experience of a year in a cash business has confirmed our theory. While the amount of sales has of necessity diminished, we are constantly, by reason of reduced expenses, lower prices, &c., extending our business to fields into which we could not otherwise have gone. Moreover, while selling on much closer margins than before the change was possible, the ratio of profits to sales is greater. But best of all, when we leave at night "we go not like the galley slave, scourged to his dungeon," by worry over approaching bills, but "sustained and soothed by an unflinching trust—we lie down to pleasant dreams."

THE SUDDEN DEATH of Charles W. Cotchett, who represented the Peck, Stow & Wilcox Company to the trade of this city and vicinity, occurred October 18, and is appropriately announced by the company. They speak of him as a young man of sterling integrity, faithful to their interests, beloved by his associates and popular with their customers. The funeral services, October 20, from his late residence, were attended by the New York managers and employees in a body, the store having been closed for that purpose.

William T. Nicholson.

THE TRADE have learned with regret of the death of William T. Nicholson, founder and president of the Nicholson File Company, Providence, R. I., announcement in regard to which appeared in our last issue. Mr. Nicholson's portrait is given herewith, and below is a sketch of his eventful career:

William T. Nicholson was born in Pawtucket, R. I., March 22, 1834, and died on the morning of the 17th inst., having been stricken with apoplexy after rising from the breakfast table the previous day. He was thus in his sixtieth year at the time of his death. His funeral was held from his residence, on Friday, at 12 o'clock noon, and was attended by a large assemblage of sympathizing friends in business and social circles.

His boyhood and school days were spent at Whitinsville, Mass., and it was there at the age of 14 that he entered the machine shop of Paul Whitin & Sons, where he remained three years and learned the machinists' trade, which was the basis of his life work. Soon after that time he came to Providence as furnishing a better field for a wider and more varied experience. After a short time spent with Halsey Hatley, one of the pioneers in the manufacture of machinery for making Screws, and subsequently with the firm of Arnold & Barber, he found employment with Joseph R. Brown, with whom and the firm of Brown & Sharpe he remained for six years, having been the foreman of their shops during the last two years of his service with them. By diligent use of his evenings, which he had devoted to the study of mechanics and mechanical drawing, he had acquired such proficiency that he was competent to make all the drawings used in the works where he was employed. In 1858 he entered into partnership with Isaac Brownell in the manufacture of jewelers' tables and light machinery, but bought out the interest of his partner in 1859, and in 1860 moved into larger quarters, materially increasing the productive capacity of his plant.

The outbreak of the Civil War, though at first followed by dull times, soon brought into active play the plant and the resources of Mr. Nicholson to supply the machinery needed to produce the small arms required by the United States Government. Soon after he engaged in the manufacture of parts of the Springfield rifle, having devised special machinery and formed a partnership

with the late Henry A. Monroe for that purpose, in addition to carrying on his machine shop. In the spring of 1864 he sold this branch of the business to his partner, Mr. Monroe. This left him free to give more attention to his machine shop, and especially to the development of an invention which he had for some time previous desired to perfect—a machine for cutting files. The successful completion of this machine soon followed, and the organization of the Nicholson File Company in 1864 was the result. Had Mr. Nicholson realized the long and tedious road which lay before him ere success would crown his efforts it is doubtful if he would have had the courage to attempt the task of building up an industry in File making by machinery. There were many times between the inception of the project and its final assured success

has been erected as the result of his efforts, and which is without a rival in completeness and capacity.

There is one thing that stands out in Mr. Nicholson's connection with his company, and it stands out so clearly and distinctly as to be almost unique, and that is, that in devotion of time, of energy, of talent and of care he gave as fully and freely as it would have been possible for him to have done had the property and interest been wholly his instead of a corporation's. In these days when trusts seem to be borne so lightly, such an example of devotion to the interests of others is worthy of being held up to public attention and emulation.

The Nicholson File Company were thus the pioneers in successfully producing machine cut Files. Previous to the incorporation of the company in

1864 goods of this character were made in Boston by the Whipple File Company, a concern having a large capital, which was eventually sunk in an endeavor to produce Files by machinery. Before them were the concerns of Ibbotson & Horner and James Horner & Co., who were located at Sing Sing, N. Y. The Nicholson File Company were also the first to pack their goods in telescope boxes, superseding the unsightly and inconvenient paper packages, which is mentioned as an indication of the pains taking care and attention given to all the details of the business in connection with the splendid enterprise which always characterized it under Mr. Nicholson's management.

Mr. Nicholson has served the city of Providence as an alderman from his



WILLIAM T. NICHOLSON.

when even his confidence and his devotion to his pet hobby came very near deserting him, and only his tenacity of purpose saved him from defeat and failure. For it should be borne in mind that his success with the machine for cutting Files made it necessary that machinery should be devised for the other operations of forging, annealing, grinding and hardening if a successful business were to be carried on. This was ultimately accomplished, and the making of machine cut Files was an unequivocal success.

But now Mr. Nicholson was brought face to face with another difficult task—that is, the selling of his goods. For years the English hand cut File had monopolized the American market, and to dislodge it from its position was the work now before him. The conflict was long and fierce, but triumph was finally his, and the noble monument to that success is found in the plant which

ward; has been a trustee of the Providence Public Library from its organization and was for several years its treasurer; was a director of the Rhode Island National Bank and the Narragansett Electric Light Company; a member of the Providence Board of Trade and of the American Society of Mechanical Engineers. In 1857 he married Elizabeth Dexter Gardner, daughter of Samuel and Alice (Mowry) Gardner, who survives him. They have had five children, Stephen, who for several years was superintendent of the File Works and who is at present connected with the company; Samuel Mowry, who in 1881 was elected secretary, and for the past two years has held the positions of vice-president and secretary; Col. William Thomas, Jr., deceased, who in his short career as a banker had earned the esteem of all who knew him; Eva, wife of Stephen Waterman, and Elizabeth, now completing her education.

The lapse of time with success achieved brought no change in the labors of Mr. Nicholson, and the closing week of his life found him actively and earnestly working for the success of the corporation which he has so conspicuously served. His death has served to develop and bring into prominence many emphatic expressions of esteem from persons in the trade who by many years of contact with Mr. Nicholson are recognized as qualified to judge. These expressions evidence the high regard in which he was held personally and as a business man. Reserved in making pledges, he was sure to redeem any guarantee thus given. Buyers with whom he had relations felt free to anticipate their wants, knowing by experience that any inequalities which might arise in a season's trade would be cheerfully adjusted on a satisfactory basis without dispute or controversy. Genial and affable, he was always cordially welcomed by those who had the pleasure of knowing him, who eagerly sought for his views on the prominent questions of the time, in regard to which he was especially well posted. He was permitted to attain to a success which is within the reach of comparatively few, and his career marks an epoch in the manufacturing methods of the line with which his activity was identified. It is pleasant to record how well deserved was the ample measure of success that he achieved, based as it was upon industry, preservation, enterprise, ability and character. He will long be remembered by the trade as capable, thorough, painstaking and absolutely trustworthy, a man of sterling integrity, exceptional sagacity and unquestioned worth.

Trade Items.

THE TRADE will observe the advertisement of C. J. Healy, 106 Chambers street, New York, referring to Keyes' patent Pliers and Nippers, on which it is intimated that a Hardwareman can make 100 per cent. profit. The fact that they are handled quite generally by jobbers of Hardware is also alluded to.

F. E. KOHLER & Co., Canton, Ohio, have taken the agency for the Champion Lawn Rake (all iron), which is manufactured by the Champion Lawn Rake Company of Canton, and are prepared to fill orders for these goods.

THOMAS C. HOAGLAND, who has for a number of years been connected with the H. B. Newhall Company, has opened an office at 85 Chambers street and 67 Reade street, New York, as direct representative of the following manufacturers: T. Rowland's Sons, Shovels, Spades and Scoops; Milton Mfg. Company, Wrought Iron Plate Washers, Hot Pressed Nuts, Machine Bolts, &c.; Carlisle Chain Works, Trace, Stake and other Bright Chain, and Coil and Cable Chains; Bedford Handle & Hard Wood Company, Axe, Pick, Sledge and other Handles; F. Gardner & Sons, Carriage and Wagon Axles.

Mr. Hoagland has also made arrangements with Wiebusch & Hilger to represent them on special lines in the New England States. For his success in this new departure Mr. Hoagland will have the best wishes of his many friends.

A FIRE BROKE OUT about 11 o'clock in the forenoon of October 24 on the premises 58 Warren street, New York. The street floor was occupied by the Excelsior Hardware Company, while the basement and sub-basement contained the stock of E. J. Brady, plumber. The fire started in the rear of the floor below the street; cause at present unknown. A rough estimate places the damage at \$4000 to \$5000, a large part of which is water damage. Both businesses were practically one interest. Insurance up to 80 per cent. was carried on the stocks, which, it is hoped, will cover the loss.

WE ARE ADVISED by S. H. Smith of Oxford, N. C., that he is carrying on the business formerly conducted by Owen, Barbour & Smith in that place, having succeeded them some months ago.

Practical Hints for Hardwaremen.

BY A. F. G.

THE AMOUNT of money to be used for family or

PERSONAL EXPENSES

should be decided upon at the beginning of each year, the amount based upon the net profits yielded by the business the year previous. The merchant should then treat himself as a clerk, paying himself a monthly or weekly salary, in accordance with the amount decided upon. It is poor policy and unbusiness-like—in fact, it is not treating the business fairly—for the merchant to give himself the run of the money drawer, and to take from it without charging himself with the amount taken. Nor is it wise to put into one's pocket cash received without accounting for it. Goods taken from the store by the proprietor should be paid for at cost from his salary if the salary plan is followed; if not, they should be charged to his account. The keeping of open accounts on the ledger, no credits being shown, with the doctor,

GROCER, BLACKSMITH, ETC.,

with whom the merchant has dealings, is to be condemned. The apparent money owed by these parties, as shown by the account, only deceives the merchant. If it is desirable for any reason to keep running accounts with such parties, the merchant should insist upon receiving their bills each month and credit them with the amounts.

IN MARKING GOODS

to yield an average per cent. profit, some goods will have to bear a greater and some a less profit than the average; while those marked at less than the average will be the ones most largely sold. It is not always safe to mark goods at the same price as a competitor is selling them for, without being satisfied what percentage of profit such prices would yield. He may be selling

them at a higher price than a legitimate profit warrants, or his price may be lower than their cost to you would justify. In the latter case he may have better facilities for buying them, or he may be selling them at a loss. The matter should be carefully examined into, to ascertain whether the goods can be bought to sell at his price, or whether he is really losing money on them. If a legitimate profit cannot be made on any class of goods, after exhausting all resources in purchasing, it is better to drop them until a profit can be made.

The advantage of doing an

ALL-CASH BUSINESS

over that of doing part cash and part credit is great. A merchant often thinks he is obliged to do business on the latter basis, when, in the course of a year, he could by easy stages, convert his customers to an all-cash system. Some who have studied the matter carefully consider that when goods are sold at the same prices to cash and credit customers, the credit part of the business yields no profit, taking into account the loss of interest on the amount credited and the amount lost by bad debts.

The experience of a firm who have recently started a strictly cash Hardware business is that they could sell a much larger quantity of goods on a credit basis, but that they sell a great many goods to people simply because they do not owe the new firm.

If, however, a credit business is done, a specified date should be agreed upon when the goods are to be paid for—a bill rendered promptly, with the expectation of its being promptly paid. Some merchants make it a rule that all goods sold on credit, on which no specified time is given, must be paid for by the end of the current month.

CASH AND CREDIT.

The amount of credit to be given in proportion to the cash business done should be decided upon at the beginning of the year, and the proportion strictly adhered to. Prudence would suggest one-quarter credit to three-quarters cash sales. By keeping a daily account of cash and credit sales, the average can be maintained.

The advantages of having the

OFFICE NEAR THE FRONT

entrance of the store cannot be overestimated. Here customers can be welcomed as they enter; clerks called to wait upon them, or waited upon by the proprietor if all the clerks are busy. Books and correspondence can here be attended to in comfort when not otherwise engaged, knowing prompt attention can be given to other matters when required. If books, correspondence and the store cannot all be properly attended to,

AN ASSISTANT

in the office is a good money investment, and may save the merchant from utter failure in business.

An Old Bill of Hardware.

THE ACCOMPANYING ILLUSTRATION is a reproduction of an old Hardware invoice, which was brought

Buffalo, N. Y. It dates, it will be observed, from 1825. The goods were sold by G. & T. Weed to James Sweeney, father of a present resident of Buffalo, by whom the bill was given

is of interest to Hardwaremen as illustrating the line of goods handled at that comparatively early date and the prices which were then prevailing, which may, perhaps, excite a feeling akin to envy

Mr Jas Sweeney To G & T Weed: D ^d	
Mar 25	3 1/4 pins 2.3
29	3 Lights 7 9 Glass c 5 1-3
Apr 10	1 1/2 8d Cutnails 10
12	1 Powder Shot & Flint (p. Haver) 3.1
17	1 Powder Shot (p. Wm) 2.0
19	1 do do (p. John) 2.0
22	1 do do (p. Wm & John) 4.6
24	1 do do (p. Hm) 2.0
May 8	2 Basins c 1/2 - & 2 little c 1/2 5.0
15	1 1/2 8d Cutnails May 20. 1 1/2 Cutnails 1.19
25	1 Little Box 1.06
June 13	1 1/2 8d Cutnails 2.24
19	1 1/2 Sugar c 85 1-19
23	1 Cutnails 6
July 24	1 1/2 Cutnails 10
28	1 do Scurd 9
Aug 17	1 Stand Saw file 1.0
26	1 1/2 Cut Boys 6.6
	1 1/2 Yds Lace p. Knawles 6.0
	1 1/2 Cup Gallies 1.0
30	1 1/2 Junk Handle 1/3 Scurd 3 1.6
	1 1/2 Goods p. 2 yr order 1-16
Sept 4	1 1/2 Praying Cloth 5
9	1 1/2 3/4 from Goodrich 75 5.5
10	1 1/2 Thimble 4
20	1 1/2 3.11/2 from Goodrich 52 2.4.4
23	1 1/2 5th Scurd 11 75 2.10
Oct 7	1 1/2 8d Cutnails Collins 5
13	1 1/2 8d do do 10 1-8
14	1 1/2 8d Wrdnails 9 1 Thimble Latch 1/2 Scurd 5 2.8
	1 1/2 1/2 Butte of Scurd 8. Wrdnails 10 2.6
	1 1/2 1/2 to Store pipe Elbow 2 1-3
Nov 5	3 Curtain pins 3/6 10.6
9	1 1/2 10d Cutnails John 10
13	6 Lights glass 6 3
Dec 2	1 1/2 10d Store pipe 1/9 1-2.2
8	1 Wire 1-3
15	1 1/2 Cutnails 11
	1 Mending tin 6
1825 Feb 17	1 Cutnails 1-5
Apr 9	1 Broom Brush 4
118	1 Spade 2
June 22	1 1/2 Fine Clippers p. Van Allen 3.6
Recd Payt G & T Weed \$33.27 13.47	

Bill of Hardware 1825.

out as one of the mementoes connected with the recent celebration of the seventy-fifth anniversary of Weed & Co.,

to Weed & Co., who have had it appropriately framed, and have given it a conspicuous place in their office. The bill

in the minds of merchants whose margins of profit on similar goods are at the present time unsatisfactorily narrow.

Price-Lists, Circulars, &c.

CLEVELAND AXLE MFG. CO., Canton, Ohio: Arrow Brand of Wagon and Carriage Axles. An illustrated catalogue shows a view of their new factory, also of Concord Express Axles, sand grooved; Square Shank Axles, one piece coach bed, fan-tail bed, coach bed; extra finish Steel Axles, half patent and taper; Long Swell Double Collar Axles, Half Collinge Axle, Self Lubricating Axles, &c. The company state that with their improved facilities they can safely promise prompt shipment of all orders received. A separate book is devoted to testimonials of their No. 6½ Concord Express Axles.

HOLLANDS MFG. COMPANY, Erie, Pa.: Chucks, Vises, Pipe Wrenches, Stocks, Dies, &c. The company issue an attractive folder, telling in verse of the Brownies in Erie. An illustration is given of their Offset Jaw Vise, surrounded by these inquisitive folk.

E. T. BARNUM, Detroit, Mich.: Wire and Iron good. Catalogue No. 570, 120 pages, is accompanied by a discount sheet and illustrates with prices and descriptions a very comprehensive line of goods. It is remarked in an introduction that the book has been compiled with the view of showing a general line of the Wire and Iron goods manufactured, and while very complete, it embraces a class of goods covering so large a field that it is possible to illustrate but a comparatively few designs of the different lines.

C. M. McCLUNG & Co., Knoxville, Tenn.: Hardware, Stoves and Tinware. Their Stove catalogue No. 4 illustrates, with prices, Ranges, Cook Stoves, Heating Stoves, Laundry, Parlor Lamp Stove, Grates, Hollow Ware, Stove Trimmings, Fire Sets, Stove Boards, Coal Vases, Iron Roofing, Freezers, Coolers, Wooden Ware, Galvanized Iron Ware, Tinware, Japanned Ware, Agate Ware, Cane Mills, Evaporators, &c.

CLAYTON BROS., Bristol, Conn., and 122 Chambers street, New York: Steel Laid and Cast Iron Shears, Hardware specialties, Leather Axle Washers, &c. Their catalogue illustrates, with list prices, straight and bent Trimmers, Bankers' or Paper Shears, Barber Shears, Buttonhole, Ladies' and Pocket Scissors, all in a variety of finishes; also Kitchen Knives, Screw Drivers and Solid Sole Leather Axle Washers. A full stock of these goods is carried at the New York office, where all communications should be addressed.

S. L. ALLEN & Co., 1107 Market street, Philadelphia: Flexible Flyers, Flyer Sleighs and Flyer Coasters. Catalogues illustrate and describe these goods, and give reasons why they are superior to others. The Flexible Flyers have light runners of T-shaped spring steel, making them strong vertically, but flexible sideways. This enables them to be guided by putting the feet on a steering bar, avoiding dragging the feet in steering and economizing in shoe leather.

THE NORWICH LOCK MFG. COMPANY, Roanoke, Va.: Mortise Locks. An illustrative, descriptive catalogue shows Mortise Locks complete in sets, selected from a large variety of the goods manufactured by the company. The catalogue is of the miniature type, and a large proportion of the Locks are represented by one-third size cuts. The Locks shown include Egyptian bronzed iron and bronze sets for inside doors,

iron and bronze sliding door sets, front door sets with brass fronts and in bronze, iron and bronze store door sets. List prices are given on a separate sheet accompanying the catalogue.

THE SEDGWICK BROS. COMPANY, Richmond, Ind.: Wire Netting, Fences and Gates, Sedgwick's Wire Stretcher, Summer Houses, Lawn Furniture, &c. Their catalogue contains illustrations, descriptions and prices of Stretcher, Farm Fencing, Lawn Fencing, Pickets, Gates, Netting, Self Opening Gate, Fencing for cemetery lots, &c.

LEGGETT & BROTHER, New York: Questions Answered, and Hints on Home Decoration, an illustrated pamphlet devoted to descriptions of and an explanation of the manner of using the firm's Varnish Stains, Enamels, Floor Paints, Gold Paint, Bath Enamel, Glass Paints, Varnishes, Liquid White Glue, Liquid Polish and Furniture Polish. The pamphlet contains no prices, and is designed to go into the hands of consumers.

It Is Reported—

That the Hardware store of Gideon Winans, Meshoppen, Wyoming County, Pa., was burned out on the 10th inst.

That the Hardware establishment of Hormell & Henry, Waynetown, Ind., was destroyed by fire on the 11th inst.

That early on the morning of the 12th inst. burglars broke into the Hardware store of Miller & Wise, Alliance, Ohio, and stole \$200 worth of Revolvers, Razors and Knives.

That William Wagner's Hardware store, at Monaca, Pa., was damaged by fire on the 9th inst. The loss was \$3000; insurance, \$2500.

That recently burglars broke into the Hardware store of C. E. Dunham, Bound Brook, N. J., and got away with about \$450 worth of Guns and Revolvers.

That Mr. Gridley of the Hardware firm of Pond, Gridley & Co., Springfield, Vt., has disposed of his interest in the business.

That the Hardware business of W. W. Harrington, North Branch, Mich., is now carried on under the style of Harrington & Weston.

That J. M. Graham & Co., are a new Hardware and Stove firm at Walurba, Pa.

That new Hardware stores have recently been opened at Perry, Oklahoma, by Spencer Hardware Company, Coulter & Brown, Wm. Flagg and H. C. Wallerstedt & Co.

That Howland & Rothfus are successors of Rothfus & Co. in the Hardware business at Blissfield, Mich.

That W. B. Adams has sold his Hardware business at Cannonsville, N. Y., to Charles Jester.

That J. S. White is now carrying on alone the Hardware business formerly conducted by White & Bromley, Sedalia, Mo.

That the Hardware establishment of Carpenter & Co., Wilkesbarre, Pa., was badly damaged by fire on the 14th inst., the loss being estimated at \$30,000.

That Victor Borgaroff has purchased the Hardware stock of Mrs. Dostal, Waverly, Minn., and will continue the business.

That E. A. Cole's hardware store at Carlton Place, Ont., was robbed on the 17th inst.

That Stephen Allen has started in the Hardware business at Brookville, Ohio.

That the Hardware store of J. C. Rittenhouse, Lee's Summit, Mo., was visited on the evening of the 19th ult. by a well-dressed young man, who asked to be shown the best Gun in the store. The clerk, who was alone in the store, took a \$60 double-barreled Parker Gun from the case, and after some hesitation the stranger agreed to buy it, but said he also wanted a box of loaded Shells for the Gun. A box of Shells was handed to him and the visitor loaded the Gun, and leveling it at the clerk's head, said: "Now young man, go to the rear of the store and keep quiet." Thus admonished the clerk obeyed, and the stranger walked out with the Gun and box of Shells and disappeared.

That Leo J. Baumgartner has succeeded Wilson & Baumgartner in the Hardware and Harness business at Armour, S. D.

That the Hardware store at Shelbyville, Ind., conducted by Fisher & Amenroth, was visited by thieves on the 9th inst., and \$300 in cash and several Revolvers were stolen.

That burglars entered the Hardware store of Dull & Moorhead, McClure, Ohio, on the 10th inst., and blew off the safe door, totally wrecking the safe. The thieves only secured \$30 in cash as a reward for their trouble.

That A. O. Oberholter's Hardware store, at Centerburg, Ohio, was destroyed in a large fire on the 30th ult.

That a fire which occurred at Fayette, Ohio, on October 7, destroyed the Hardware stores of E. S. Perry and W. Acker.

That the Dickinson Hardware Company, Little Rock, Ark., are intending to erect a three-story stone and brick structure which they will occupy on completion. The building will cost from \$12,000 to \$15,000. It will be 50 feet wide and 150 feet long. Pressed brick and granite are the materials which will be used in its construction.

That I. S. Rist has closed out his Hardware business at Marshalltown, Iowa. Mr. Rist is in ill health and will try farm life for a while.

That the Brooks Hardware Company have been incorporated at Denver, Col., with a capital of \$20,000.

That burglars recently broke into the Hardware store of F. J. Simen at Humbird, Wis., and secured \$40 worth of goods and some valuable papers.

That O. Beckington, Hardware merchant, Belvidere, Ill., has sold out his business to a new firm consisting of O. Rogers of Elgin and L. C. Cockran of Belvidere.

That W. L. Trimble and Messick & Dryden have purchased the Hardware stock of John W. Lincoln, Liberty, Mo., and will divide it between themselves.

That John L. Thomas has purchased the Smith Hardware stock at Red Oak, Iowa. His son, David Thomas, will have charge of the business.

That O. E. Wheaton of Kenton, Ohio, is thinking of entering the Hardware business at West Mansfield.

That Carl Plumb, Henderson, Iowa, has sold out his Hardware store to West & Martindale of Oakland.

That the store of the Holley Hardware Company, Rathdurm, Iowa, was destroyed by fire on the 27th ult.

That Frank Conrad, Hardware dealer, Thomson, Ill., has sold out to Thomas Stagg.

That the Hardware store of Howe & Parish, Klamath Falls, Ore., was recently visited by fire, which damaged the establishment to the extent of \$1000.

That Thomas Dunn & Co., dealers in Hardware, New Westminster, B. C., have sold out to A. Godfrey.

That E. S. Perry's Hardware store, at Fayette, Ohio, was destroyed by fire on the 7th inst.

That William G. Hayden, in the Hardware and Tin business, New Bedford, Mass., has sold out to a new firm under the style of James R. Denham & Co.

That S. Z. Hudson has purchased the T. R. Young Hardware stock, at Reedsburg, Wis.

That Mace Bros. have purchased J. A. Shaffer's stock of Hardware at Center Point, Ind.

That C. F. Morrison, Hardware merchant, Wilkesboro, N. C., is building a new brick Hardware store.

That Charles Hicks and William Hicks contemplate entering the Hardware business at East Bloomfield, N. Y.

That burglars entered the Hardware store of A. Neil, Sauk Rapids, Minn., on the 3d inst., and got away with \$60 worth of Revolvers, Razors, &c.

That the Hardware firm of H. W. Mills & Co., Paterson, N. J., has been dissolved, O. W. Mills retiring on account of ill health. The business will be continued by H. W. Mills.

That the Hardware stores of the Prusia Hardware Company and J. W. Ryan, Fort Dodge, Iowa, were burglarized on the 3d inst. At the former place the cash register was rifled and six expensive Revolvers were stolen. At the latter store about \$20 in cash and a small quantity of goods were secured.

That C. F. Thompson, Hardware merchant, Brattleboro, Vt., has sold out.

That the stock of Hook & Slosson, Hardware dealers, Sabetha, Kan., was damaged by fire on the 26th ult.

That M. T. Howard's Hardware store, at Rice Lake, Wis., was robbed on the 29th ult. of \$400 worth of goods and \$40 in cash. The thieves broke the glass in a door in the rear of the store and pushed back the bolt.

That Charles Hawks and Ives Smith have bought the Stove and Tin business of C. W. Smith, Lee, Mass.

That Adams & Ridley, dealers in Hardware, Stoves and Agricultural Implements, Brunswick, Maine, have disposed of their business to Ridley & Jones.

That O. C. Story is now carrying on the Stove and Tin business formerly conducted by Joseph F. Smith at Essex, Mass.

That D. W. C. Nichols & Co., Hardware merchants, Bloomfield, Neb., have sold out to M. S. Goff.

That a copartnership has been formed by Joseph P. Reed and J. Mortimer Darby of North Adams, Mass., who will engage in the Hardware business at that point. The business will be started in a new building which is being constructed with special reference to the needs of the modern Hardware store. The store will be ready for occupancy

in a few days, and the firm expect to open their doors to the public about November 1.

That Charles Prather has commenced the Stove and Tin business at Manchester, Ohio.

That burglars entered the Hardware store of C. J. Monson, Abercrombie, N. D., on the 1st inst. and stole three breech loading shot guns.

That Goldcamp Bros. & Co. have purchased the Hardware stock and business of the late H. D. Newcomb, Ironton, Ohio. The price was \$11,000. The members of the new firm are John and F. F. Goldcamp and H. C. Rudman.

That James A. Moren has sold his half interest in the Hardware firm of Draper & Moren, Converse, Ind., to A. J. Webb. The style of the firm will hereafter be Draper & Webb.

That the Beyers Hardware Company's store at Colorado, Texas, was destroyed by fire on the 26th ult.

That A. C. Baker of the Hardware firm of Baker & Bissell, Sioux Falls, Iowa, who assigned some time since with heavy liabilities, has settled with the creditors and again resumed business.

That Elwood Brown has sold his interest in the Hardware firm of Wentworth & Brown, Benton Harbor, Mich., to J. J. Baker. The firm style has become Wentworth & Baker.

That H. Moffett & Co., Hardware dealers, Tulare, Cal., have disposed of their business to O. R. Cross & Co.

That on the 29th ult. the Hardware store of C. B. Dobie, Sigourney, Iowa, was entered by burglars who carried off about \$200 worth of Pocket Knives and Guns.

That Turner & Archibald, Ridge Farm, Ill., have sold their Hardware store to Jenkins Bros. of Danville.

That T. W. Jameson of Farmer City, Ill., has bought the Hardware and Stove stock of the Leavitt & Ogleve Company, Clinton, Ill.

That the Harper-Reynolds Hardware Company, Los Angeles, Cal., have been systematically robbed during the past two or three months by one of their employees, who during that time has stolen Revolvers and Shot Guns valued at \$500 or \$600. The clerk has been arrested and has confessed his guilt.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

The general movement has been very fair and in some instances rather ahead of the average for this season of the year. Bulk goods used by glass manufacturers have been in noticeably good demand, as have the lines of Colors that are used largely by wall paper and curtain manufacturers. Grinders have purchased with a fair degree of freedom. In house painters' goods the trade passing is hardly equal in volume to the average of the first half of the month.

White Lead.—Fairly good orders for Dry Lead have been placed by grinders, and the distribution of Lead in Oil was referred to as having been quite satisfactory. Prices remain almost pre-

cisely as they were last week, the only irregularity being in quick process and some outside Western brands.

Red Lead.—There has been more inquiry for foreign brands for future delivery and improvement also in actual sales. Prices are somewhat firmer in consequence of this, but not positively higher. Former quotations for American brands remain in force.

Litharge.—Glass manufacturers have placed some fairly large orders for stock for delivery during the next 60 days, the most of which were taken at about former prices. The finer qualities have met with merely routine sales, and quotations remain unchanged.

Zincs.—The demand has been good from grinders, who have been drawing freely upon their contracts. Beyond this nothing is being done as regards new transactions. For the present we quote 4¢ @ 4½¢ as to quality and quantity. Foreign makes are more or less unsettled as regards some special brands. Consequently it is almost impossible to give correct quotations, though it is claimed that the list price is adhered to.

Colors.—There has been an active business in the lines of Colors particularly adapted to the needs of paper manufacturers, but, this aside, the movement has been confined chiefly to ordinary jobbing distribution. Prices show only slight variation.

Oils and Turpentine.

The market has remained bare of distinctly new or interesting features. Nothing has transpired in any direction that would arouse speculative interest on the part of home buyers and exporters have operated very indifferently. Few changes in prices and only slight ones have taken place, but the rather dull condition of trade serves to impart rather weak undertone in some departments.

Linseed Oil.—Purchases have been almost invariably on a rather small scale and at practically the line of prices that has prevailed for some little time past. It is stated that current prices have been offered for round lots of both Western and city brands for future delivery and refused. Ordinary spot parcels are readily obtained at 40¢ for city and 38¢ for Western brands.

Cotton Seed Oils.—There has been a very fair but irregular business, and prices are still somewhat variable, although not moving very far in any direction. The situation is practically the same as it was a week ago. There is little support outside of what is given by purchases of large Western consumers direct at the producing points.

Lard Oil.—Pressers are very firm, asking as high as 77¢ @ 78¢ in some instances, and turning down all bids of less than 75¢ for prime Oil. Business has been slow, however, and the demand at present is moderate.

Fish Oils.—No important movement in any variety of crude products has taken place, and there is little business under way at the present time. The pressed and bleached Oils are selling fairly at old prices.

Miscellaneous.—Olive and Cocoanut Oils have remained quiet and unchanged. Red Oils have met with better sale at previous rates.

Spirits Turpentine.—The movement in prices has been very narrow, not exceeding ¼¢ @ ½¢ gallon, and business has been of commonplace type. Late dealings were at 29¢ for regular and 29½¢ for machine barrels.

Streeter's Mincing Knives.

N. R. Streeter & Co., Groton, N. Y., are putting a line of mincing knives on the market, as herewith shown. The handles are cast iron with detachable nickel plated blades. The blades are of



Fig. 1.—Streeter's No. 10 Mincing Knife.

fine steel so that they can be sharpened, and are made in skeleton shape to prevent clogging. Fig. 1 represents the one-bladed knife, the blade being held

tirely different construction, having a sunken metal hopper and closed swing cover top.

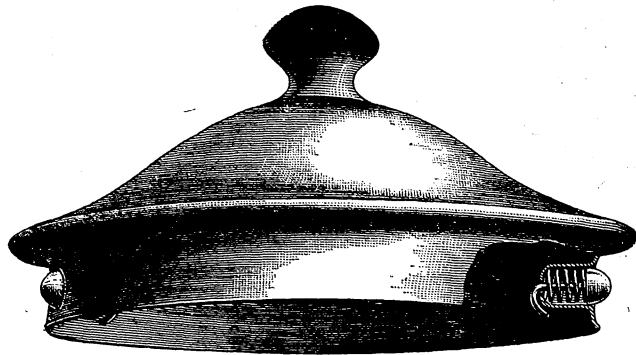
Cover with Springs.

Boas Brothers, 231-325 Greenwich street, New York, are using their patented springs on tea and coffee pot

a bowl full of good eggs by dropping a bad one into them. The openers are made in nickel and silver plate, embossed, the silver plated ones being put up in satin lined cases.

Evory's Plumbers' Tacks.

The illustration herewith shows a plumbers' tack, now being introduced to



Cover with Springs.

mant enameled ware, as illustrated herewith. The springs and knobs are made of brass to prevent rusting, the spring holding the knob against the

the trade by the Evory Mfg. Company, 21 and 23 Ann street, New York. It is made of cast iron, and furnished either plain, tinned or nickel plated. The claim is

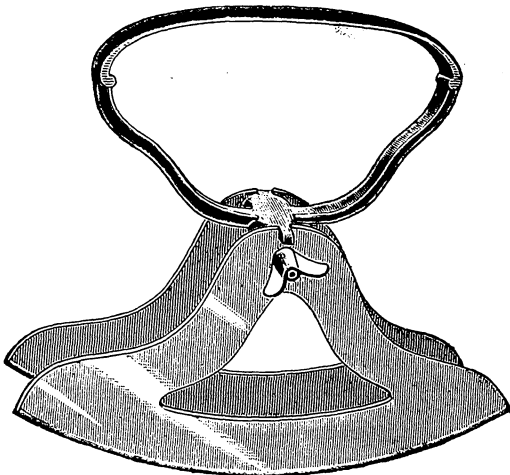


Fig. 2.—Duplex Mincing Knife.

securely by a screw passing through the plates on both sides. In the Duplex knife, Fig. 2, the blades are held in position by a square shouldered bolt with a thumb screw. The blades of the Sensible knife, Fig. 3, are held by a heavy bent wire hook with a nut on the top. The knives, Figs. 2 and 3, have lugs or grooves to prevent the blades from turning and to assist in holding them rigidly in position. Thus the blades can be easily removed for sharpening or cleaning. The durability and attractiveness of the goods are features emphasized by the manufacturers; also the low price at which the knives can be sold, the Sensible, Fig. 3 for instance, being designed to retail for 25 cents each.

THE NUMBER of the Sun Mfg. Company's Receptacle Mill, an illustrated description of which appeared in our issue of October 5, 1893, should have been No. 1080, instead of 1085, as given. Their Mill No. 1085 is of en-

covers, in connection with their Ada inside of the rim of the pot with enough force to prevent the cover from falling off when pouring from the pot. There is no offset on the inside of the pot's rim, so the cover may be lifted off almost as easily as if the springs were not there.

Champion Egg Opener.

The Champion egg opener is offered by the Magic Introduction Company, 321 Broadway, New York. The handles are loop shape, similar to scissors handles. The curved pieces which surround the egg are provided with sharp teeth, so as to cut off the top of the egg shell. The opener is designed for table use, to obviate the unpleasant results that accompany opening soft boiled eggs with a knife or spoon; also for use in the kitchen, by which the contents of the egg are exposed while yet in the shell, thus avoiding the spoiling of

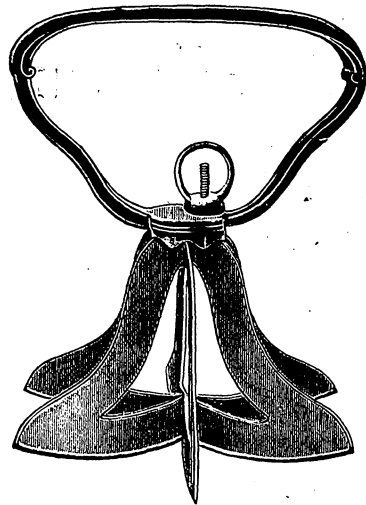
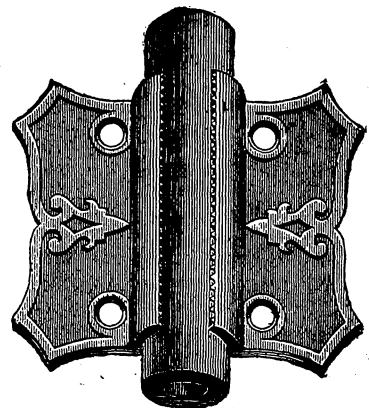


Fig. 3.—Sensible Mincing Knife.

made that the device does not need to be soldered to the pipe, thereby saving



Evory's Plumbers' Tack.

time and material. The jaws are ridged and so made that the tighter the screws that fasten up to the wood work are

turned the tighter they grip the pipe, tests having shown, it is claimed, that they will sustain a strain far in excess of any that is likely to be put on a lead pipe. Several new modifications have recently been added to the variety,

Forg's Adjustable Door Stop and Holder.

The door stop and holder shown in the accompanying cuts is put on the

The Royal Heater.

The Plume & Atwood Mfg. Company, 18 Murray street, New York, are offering the trade a heater to be used in connection with center draft lamps or

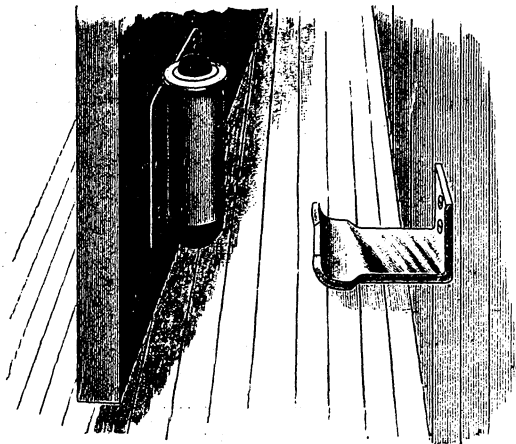


Fig. 1.—No. 155 Door Stop and Holder.

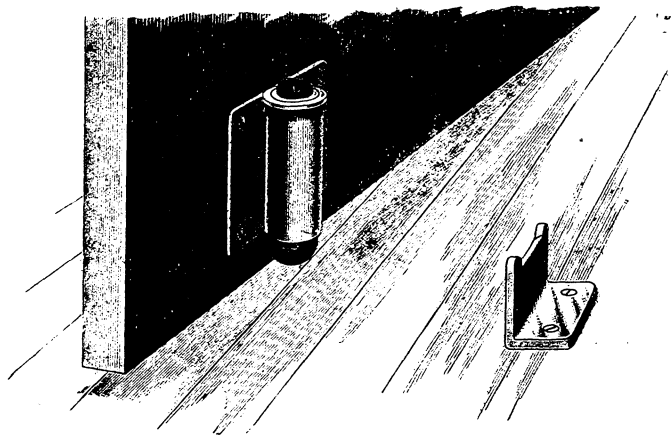
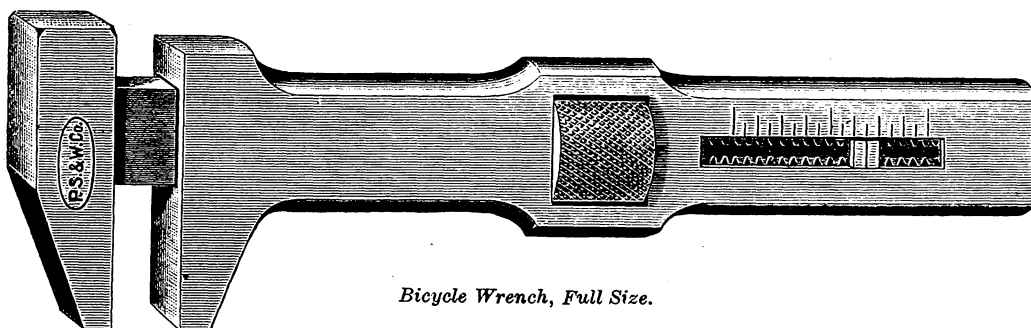


Fig. 2.—No. 156 Door Stop and Holder.

adapting them to all the requirements for ceilings, side walls, corners, cornices, &c. One form is made to hold two pipes for the flush and supply of water closet tanks and for holding bibbs or

market by P. Forg, Somerville, Mass. The door stop consists of a bolt and spring inclosed in a casing, which is fastened on the door. The bolt can be readily extended and adjusted with an

argand gas burners, as shown in Fig. 1. The heater is made of full nickel plated metal and is easily attached to a lamp, as in Fig. 2, and as easily removed. The heater is so constructed on top



Bicycle Wrench, Full Size.

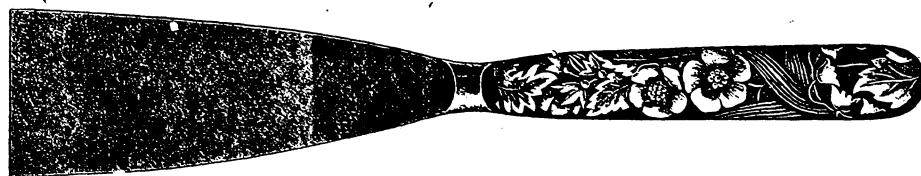
T-branches. Their quick adjustment and wide usefulness have made them popular with plumbers who have used them.

Solid Steel Putty Knife.

The accompanying cut represents a solid steel putty knife, put on the mar-

ordinary screw driver. The holders are made of brass, the one shown in Fig. 1 being intended for use on the mop board or wall, and can be used at either the top or bottom of the door. The holder in Fig. 2 is for use on the floor, where the opening of a door too wide would cause the door to strike against a desk or other article of furniture. The stops

that small vessels containing water for shaving or other purposes, or milk or food for infants or the sick, may be quickly heated. It is remarked that the heater is constructed on the prin-



Solid Steel Putty Knife.

ket by Charles J. Healy, 106 Chambers street, New York. The knife is forged from a solid piece of steel, resulting in a handle and blade in one piece. The handle is embossed, and the whole knife nickel plated. A feature of the knife is the low price at which it is supplied to the trade, selling as it does at \$1 per dozen.

THE STOCK of Hardware, Nails, Iron and Steel, &c., of C. F. Thompson & Co., Brattleboro, Vt., has been disposed of to Mellen & Proctor and Robbins & Cowles, who conduct the only other Hardware stores in the town. Mr. Thompson retires from business after an experience of over 47 years as clerk, partner and principal in the same store.

and holders are made in two sizes, 2½ and 3 inches.

Bicycle Wrench.

Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers street, New York, are introducing a bicycle wrench, as shown in the accompanying full size cut. The wrench is all of forged steel, polished and nickel plated. It is provided with a scale so that it can be readily adjusted to any sized nut or screw or bolt. The parts are designed strong enough to withstand all necessary strain without making it too heavy for bicycle use.

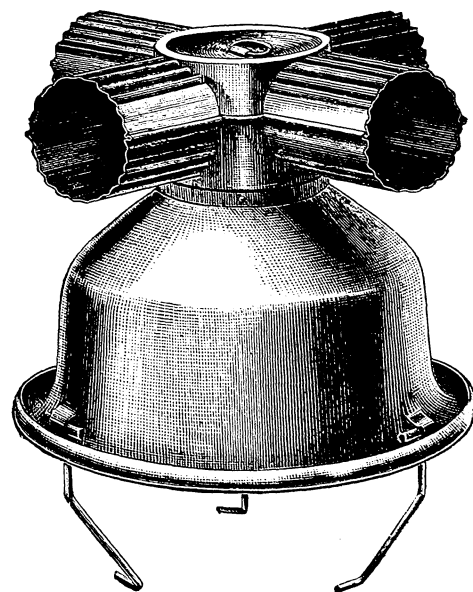


Fig. 1.—The Royal Heater.

ciple that it creates an increased or forced draft, not only through the chimney, whereby the combustion is made more perfect, but also under the

shade, so that the cold air is constantly drawn under the shade, and being heated by the surface of the hot chimney, ascends to the heater, where it is still further heated by direct influence of the flame before it is discharged into the room. The manufacturers point out that this is a convenient, attractive, efficient and inexpensive mode of heating; that the device will heat small

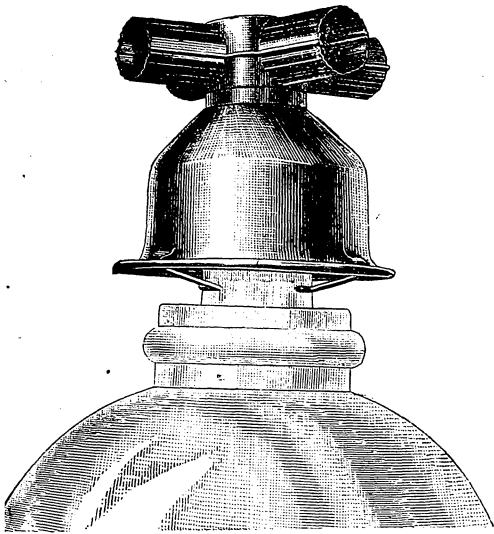


Fig. 2.—Position of Heater on Chimney.

rooms, bedrooms and bathrooms without the use of other heat; that it is a valuable auxiliary in any size room in damp and extremely cold weather and that as a result of better combustion the heater saves 20 per cent. of the oil. The makers state that the best results are obtained by using the heater with their Royal and Banner lamps, though it is adapted to any center draft lamp or argand gas burner.

Crescent Lock Joint Stove Pipe.

The accompanying cuts represent Crescent lock joint stove pipe, introduced by Logan, Gregg & Co., Pitts-

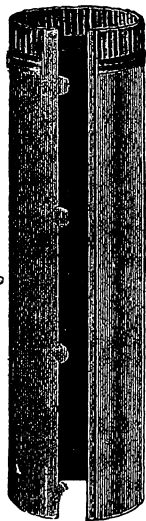


Fig. 1.—Showing Lugs and Groove.



Fig. 2.—Lugs Turned Back.

Crescent Lock Joint Stove Pipe.

burgh, Pa. One edge of the iron is grooved and pierced, as shown in Fig. 1, to receive the lugs formed on the other side. When joined the lugs are turned back, as in Fig. 2, holding firmly, it is stated, and making a per-

fectly smoke tight joint. The pipe is made in 4, 5, 6 and 7 inch sizes, packed as in Fig. 3, in crates of 25 joints, for shipment. The manufacturers state

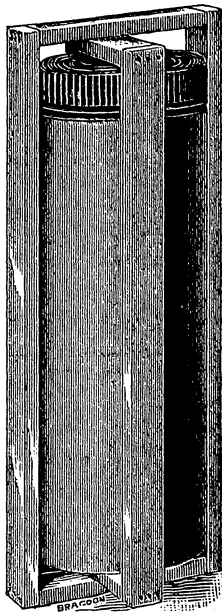


Fig. 3.—Manner of Crating Pipe.

that they are having a large demand for the pipe wherever it has been introduced.

G. W. WHITING, who has for a number of years been representing Sickels, Sweet & Lyon to the nearby trade, is still using as a pocket price book one of the catalogues of Walsh, Coulter & Flagler, with whom he was formerly connected. This catalogue bears date 1876, is without illustrations and contains lists of the leading goods in a compact and convenient form. It has, however, been in use for about 17 years and there is scarcely a list which has not been repeatedly changed, so that it is interesting to observe the succession of interlineations, erasures and corrections which have been made on its pages. It is also curious to note the changes which have occurred in the line of goods to which it is devoted. Mr. Whiting is now about to retire the book from active service and to put in its place one of *The Iron Age* Hardware Price Books, Style B, on the pages of which with much systematic care he has already entered list prices and discounts on the large and varied line of goods which he is offering to the trade. The Standard Hardware Lists are also made use of. In some cases where it is desirable to have illustrations of the goods, Mr. Whiting has made miniature sketches, preferring to do this rather than to insert the manufacturers' cuts, which in most instances are too large.

THE ANNUAL CONFERENCE of the National Paint, Oil and Varnish Association will be held in the Monongahela House, Pittsburgh, commencing on Tuesday, November 21, and will probably continue in session three or four days. The Pittsburgh Paint and Drug Club are making extensive preparations to receive their guests, and a number of excursions to different points of interest in and about Pittsburgh have already been arranged. It is also probable that a banquet will be given the delegates during their stay in Pittsburgh.

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Current Hardware Prices.

OCTOBER 25, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character "u" is used to indicate a range of price; thus discount 50&10&50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic..... $\frac{1}{2}$ doz \$3.00, 88 $\frac{1}{2}$ ¢@33 $\frac{1}{2}$ ¢&10%
Excelsior..... $\frac{1}{2}$ doz \$10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils—

Eagle Anvils, $\frac{1}{2}$ & 1 ft.....15&15&5%
Peter Wright's.....11&11 $\frac{1}{2}$ ¢
Armstrong's Mouse Hole.....10&10 $\frac{1}{2}$ ¢
Am. Wrought, Horse shoe brand, 11&11 $\frac{1}{2}$ ¢
Trenton.....10&10 $\frac{1}{2}$ ¢
Wilkinson's.....10&10 $\frac{1}{2}$ ¢
Moore & Barnes Mfg. Co.....83 $\frac{1}{2}$ ¢

Anvil Vise and Drill—

Millers Falls Co., \$18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise \$3.00.....45&10%
Star.....45&10%

Apple Parers—See Parers Apple, &c.

Augers and Bits—

Common Augers and Bits.....70&70&10%
Boring Machine Augers.....70&70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits 25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&10%
C. E. Jennings & Co., No. 10, extension.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, $\frac{1}{2}$ set, 32 $\frac{1}{2}$ quarters, No. 5, 35; No. 30, \$3.50, 25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forster Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list) 30&80&25%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, \$18; large, \$26.....35&35&10%
Ives' No. 4, $\frac{1}{2}$ doz \$60.....40%
Swan's.....40%
Steer's, No. 1, \$28; No. 2, \$18.....35&40%
Stearns' No. 2, \$48.....20%

Gimlet Bits—

Common..... $\frac{1}{2}$ gross \$2.75 @ \$3.25
Diamond..... $\frac{1}{2}$ doz \$1.25.....40&10%
Bee.....25&25&5%
Double Cut.....
Shepardson's.....45&45&10%
Ct. Valley Mfg. Co..... $\frac{1}{2}$ gross \$10.00.....40&10%
Hartwell's..... $\frac{1}{2}$ gross \$10.00.....40&10%
Douglass.....40&10%
Ives.....60&60&10%

Hollow Augers—

Ives' French, Swift & Co. (Beecher) 83 $\frac{1}{2}$ ¢@33 $\frac{1}{2}$ ¢&10%
Douglass.....
Bonney's Adjustable, $\frac{1}{2}$ doz \$48.....50%
Stearns'.....20&10%
Ives' expansive, each \$4.50.....60&5%
Universal Expansive, each \$4.50.....30%
Wood's.....25&25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10&15&10&5%
Watrous.....25&25&10%
Snell's.....25&25&10%
Snell's Ship Auger Pat'n Car Bits.....15&10&15&10&5%

Awl Hafts—See Hafts, Awl.

Awls—

Awls, Sewing, Common..... $\frac{1}{2}$ gr. 85¢@90¢
Awls, Should. Peg..... $\frac{1}{2}$ gr. \$1.50 @ \$1.55
Awls, Pat. Peg..... $\frac{1}{2}$ gr. 35¢@38¢
Awls, Shouldered Brad..... $\frac{1}{2}$ gr. \$1.30 @ \$1.40
Awls, Handled Brad..... $\frac{1}{2}$ gr. \$2.50 @ \$3.00
Awls, Handled Scratch..... $\frac{1}{2}$ gr. \$4.00 @ \$5.00
Awls, Socket Scratch..... $\frac{1}{2}$ doz. \$1.10 @ \$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

Plain. Beveled.
First quality, best brands \$7.00.....\$7.50
First qual., other brands.....6.75
Second quality.....5.50 6.00

Axle Grease—See Grease, Axle.

Axles—

No. 1.....34¢@44¢, No. 2, 5¢@8¢
Nos. 7 to 12.....60&10%
Nos. 15 to 18.....47%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....41¢@46¢
Concord Axles, solid collar.....25¢@26¢
National Tubular Self Oiling.....38¢@38 $\frac{1}{2}$ ¢&5

Bag Holders—See Holders, Bag.

Balances—

Spring Balances.....
No. 2000 20 30.....40%
Chatillon, $\frac{1}{2}$ doz.....\$0.80 0.95 1.75 net
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire—See Wire, Barb.

Bars—

Crow..... $\frac{1}{2}$ doz 31¢
Iron, Steel Points..... $\frac{1}{2}$ doz 31¢

Basins, Wash—

Standard Fiberglass, No. 1, 10 $\frac{1}{2}$ -in., \$1.30;
12-in., \$2.00; 13 $\frac{1}{2}$ -in., \$2.50; 15-in., \$3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82.....50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33 $\frac{1}{2}$ ¢

Beaters—

Egg.....
Dover..... $\frac{1}{2}$ doz \$1.00 @ \$1.20
Duplex (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
Dover (Standard Co.)..... $\frac{1}{2}$ doz \$1.00
Duplex Extra Heavy (Standard Co.)..... $\frac{1}{2}$ doz \$3.50
Bryant's..... $\frac{1}{2}$ gross \$14.00
Double (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross, No. 0 \$12.00; No. 1 \$15.00; No. 2.....\$26.00
Easy (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$12.00
Triple (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$18.50
Spiral..... $\frac{1}{2}$ gross \$4.25 @ \$4.50
Improved Acme (H. & R. Mfg. Co.)..... $\frac{1}{2}$ gross \$9.00
Silver & Co..... $\frac{1}{2}$ doz \$5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, \$1;
No. 2, \$2.....20%

Bells—

Cow.....
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, Star.....20&10%
Easy (H. & R. Mfg. Co.).....70&10%
Kentucky, Sargent's list.....70&10%
Kentucky, Durham.....70&10%
Dodge, Genuine Kentucky.....70&70&10%
Texas Star.....50&10&50&10&5%

Door—

Gong, Abbe's.....33 $\frac{1}{2}$ ¢@10%
Gong, Yanko.....45&10%
Gong, Barton.....40&10&50%
Crane, Brooks.....50&10&2%
Crane, Cone's.....10%
Crane, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated.....net
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10&70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33 $\frac{1}{2}$ ¢@10%
Globe Cone's Patent.....25&10&35%

Miscellaneous—

Call.....45&50%
Farm Bells..... $\frac{1}{2}$ doz \$3.33
Steel Alloy Church and School Bells.....40%

Bellows—

Blacksmith's.....60&10&5&60&10&10%
Molders.....40&10&50%
Hand Bellows.....40&10&50%

Belting, Rubber—

Common Standard.....75&75&10%
Standard.....70&5&70&10%
Extra.....60&10&60&10&10%
N.Y.B. & P. Co., Carbon.....60&60&5%
N.Y.B. & P. Co., Diamond.....50&50&5%
N.Y.B. & P. Co., Para.....40&40&5%

Bench Stops—See Stops, Bench

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters.....15%
Detroit Perfect Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—

Cleveland Block Co., Mal. Iron.....60&60&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also Machines, Hoisting.

Bolts—

Carriage, Machine, &c.—
Com. list June 10, '84.....80&80&5%
Genuine Eagle, Norway, list Oct. '84.....80&5&80&10%
Eagle, Norway, list Oct. '84.....80&10&80&15%
Phila. pattern, list Oct. 7, '84.....80%
R.B. & W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list).....65&10%
Ives' Patent Door Bolts.....60&10&60&10&5%
Wrought Barrel.....70&10&75%
Wrought Square.....70&10&75%
Wrt Shutter, all iron, Stanley.....60&10&60&10&10%
Wrt Shutter, Brass Knob.....60&50&5%
Wrt Shutter, Sargent's list.....60&10%
Wrt Sunk Flush, Sargent's list.....60&10%
Wrt Sunk Flush, Stanley's list.....50&10&5%
Wrt B. K. Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10&60&10&10%
Plow.....60&10&50&60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65&65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84.....80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Bore.....33 $\frac{1}{2}$ ¢@5%
Enterprise Mfg. Co.....33 $\frac{1}{2}$ ¢@5%
Clark's.....33 $\frac{1}{2}$ ¢@5%

Borax—

Per B.....94¢@104¢

Boring Machines—See Machines, Boring.

Box Pins—See Pins, Box.

Boxes, Wagon—

Per B.....24¢

Boxes, Miter.

Spilker's Excelsior, 3 in. \$7.50, 4 in. \$8.50, 5 in. \$13.00, 6 in. \$15.00.....20%

Braces—

American Bit Brace and Tool Co.
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 30, 37.....70&10&5%
Adair's:
Barker's Imp'd Plain.....75&10&80%
Barker's Imp. Nickeled.....65&10&70%
Ratchet.....75&10&80%
Eclipse Ratchet.....60%
Globe Jawed.....40&40&10%
Corner Brace.....40&40&10%
Universal, 8 in., \$2.10; 10 in., \$2.25
Buffalo Ball.....\$1.10 @ \$1.15
Barber's.....60&10%
Saxton's.....60&10%
Barker's Imp. Polished.....75&10&80%
Barker's Imp. Nickeled.....65&10&70%
Ratchet, Polished.....60&10&60%
Ratchet, Nickeled.....40&10&60%
Buffalo Ball.....net, \$1.10 @ \$1.15

Bartholomew's,
Nos. 25, 27 and 30.....50&10&60&5%
Nos. 117, 118, 119.....70&70&5%
Common Ball, American.....\$1.00 @ \$1.10
Fray's Genuine Spotted's.....50&5&60&10%
Fray's Nos. 70 to 120, \$1 to 123, 207 to 414.....50&10%
Ives' New Haven Novelty.....70&70&5%
New Haven Ratchet.....60&5&60&10%
Barber Ratchet.....60&5&60&10%
Barber's.....60&5%
Spotted.....60&5&60&10%
P. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain.....
Regular, list.....65¢@70¢
Sargent's list.....60&10&70&10%
Shelf, fancy.....
Sargent's list.....70&70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See Wire.

Brilliers—

Hemis Self-Inch.....9 10 9x11
Basting..... $\frac{1}{2}$ Per doz.....\$4.50 5.50 6.50
New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless..... $\frac{1}{2}$ doz. \$12. 50%
Queen City.....33 $\frac{1}{2}$ ¢

Buckets, Well—

Galvanized—
Hill's..... $\frac{1}{2}$ doz. 12 qt. \$4.25; 14 qt. \$5.25
Iron Clad..... $\frac{1}{2}$ doz. 14 qt. \$4.25 @ \$4.50
Helwig's Flat Iron Band.....\$3.75
Helwig's Wired Top..... $\frac{1}{2}$ doz \$4.00

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers, Butchers.

Butts—

Brass—
Wrought Brass.....80&80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33 $\frac{1}{2}$ ¢@10%
Cast Brass, Loose Joint.....33 $\frac{1}{2}$ ¢@10%

Cast Iron—

Fast Joint, Narrow.....50&10&5&60%
Fast Joint, Broad.....50&10&60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns.....
Parliament Butts.....75¢@75¢
Mayer's Hinges.....&10%
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned.....
Loose Pin, Acorns, Japanned, Plated Tips.....

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
Bronzed Wrought Butts.....50&50&10%

Cages, Bird—

Hendryx, Brass or Enameled.....50&10%
Hendryx, Wood.....40&10%

Calipers—See Compasses.

Calks, Toe—

Gautier, One Prong, Blunt.....54¢@6¢
Burke's One Prong, Blunt.....54¢@6¢
Burke's Two Prong, Blunt.....74¢@8¢
Burke's One Prong, Sharp.....64¢@7¢

Can Openers—See Openers.

Cans, Milk—

S. S. & Co.: 5-gal., \$3.00; 8-gal., \$4.40;
10-gal., \$4.75 each.....40&10

Cans, Oil—

Galvanized Blue Band, 5 gal., Tip-Top, $\frac{1}{2}$ doz, \$12.00
Galvanized Blue Band, 5 gal., Faucet, $\frac{1}{2}$ doz, \$8.00
Galvanized Blue Band, 1 gal., $\frac{1}{2}$ doz, \$2.25
Glass Oil, Friend..... $\frac{1}{2}$ doz, \$2.75

Caps—

Percussion—
Hicks & Goldmark's and Union Metallic Cartridge Co. \$1000
F. L. Waterproof, 1-10's.....35¢@37¢
E. B. Trimmed Edge, 1-10's.....47¢@50¢
E. B. Grand Edge, Cent. Fire, 1-10's.....47¢@50¢
Musket, Waterproof, 1-10's.....50¢@52¢
G. D.....27¢@30¢
S. B. Genuine Imported.....27¢@30¢
Eley's E. B.....50¢@52¢
Eley's D Waterproof, Central Fire. \$1.60

Primers—

Berdan Primers, \$1.00.....2¢
B. L. Caps (Sturtevant Shells) \$1.00.....2¢
All other Primers, \$1.20.....2¢

Cards—

Watson's Cotton, Wool, Horse and File, list January 23, 1891.....25%

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

Rim Fire Cartridges.....50¢@52¢
Rim Fire Military.....15¢@2¢
Cent. Fire, Pistol and Rifle.....25¢@2¢
Cent. Fire, Military and Sporting.....15¢@2¢
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., \$1.75.....2¢
Blank Cartridges, 32 cal., \$3.50.....2¢
Primed Shells and Bullets.....15¢@2¢
B. Caps, Round Ball, \$1.75.....2¢
B. Caps, Con. Ball, Swgd., \$2.00.....2¢

Carpet Sweepers—

See Sweepers, Carpet.

Casters—

Bed.....Brass.....55¢@55&10%
Plate.....Others.....60¢@60&10%
Shallow Socket.....40&10%
Deep Socket.....40&10%
Martin's Patent (Phoenix) 45&10&50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70¢@70&10%
Payson's Truck.....60¢@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50¢@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—

See Leaders, Cattle.

Cement—

Chalk Lines—See Lines.**Checks, Door—**

Unity	.....50%
Chisels—	
Socket Framing and Firmer	
P. S. & W.	
New Haven	
Widtherby	75&10@75&10&10%
Mix	
Ohio Tool Co.	
Douglass	75@75&5%
Buck Bros	30%
Merrill	60&10@60&10&5%
L. & J. White	30&30&5%

Tanged and Miscellaneous.
Tanged Firmers.....50@50&10%
Butchers'.....\$4.75@5.00 to 2
Spear & Jacksons'.....\$5 to 2
Buck Bros.....\$5 to 2
Cold Chisels, fair quality, # 1.....1&10%

Chucks—

Beach Pat.	each, \$8.00.....20%
Morse's Adjustable, each, \$7.00, 20@25&5%	
Danbury	each, \$6.00, 30@30&5%
Syracuse, Bal. Pat.	.....25%
Graham Patent	.....30&5%
Skinner's Patent Chucks	
Combination Lathe Chucks.....33&5%	
Universal Lathe Chucks.....40%	
Independent Lathe Chucks.....40%	
Drill Chucks.....15%	
Union Mfg. Co.	
Victor	.....\$8.50, 25%
Combination	.....40%
Universal	.....40%
Independent	.....40%

Churns—

Tiffin Union, each, 5 gal. \$3.25; 7 gal. \$3.75; 10 gal. \$4.25.....	
McDermid Star Barrel Churn, each 6 gal., \$2.60; 10 gal., \$2.75; 15 gal., \$3.00; 20 gal., \$3.25.....	

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%	
Adjustable, Cincinnati.....15&10%	
Adjustable, Hammers.....15@15&5%	
Adjustable, Stearns'.....30@30&10%	
Stearns' Adjustable Cabinet and Corner.....30@30&10%	
Cabinet, Sargent's.....70&10%	
Carriage Makers', Sargent's.....75@75&5%	
Carriage Makers', P. S. & W. Co.....40&10%	
Eberhard Mfg. Co.....40&5@40&10%	
Warner's.....40&10@40&10&5%	
Saw Clamps, see Vises, Saw Filers'.....25&10%	
Carpenter's, Cincinnati.....25&10%	
Barnes' Machinists' Clamps.....33&5%	

Cleavers, Butchers'—

Bradley's.....25@30%	
L. & J. White.....20&5%	
Beatty's.....40@40&5%	
New Haven Edge Tool Co.'s.....40%	
P. S. & W. Co.....39&25@39&40%	
Foster Bros.....40@40&5%	
Schulte, Lohoff & Co.....40@40&5%	

Clips—

Norway, Axle, 1/4 & 5-16.....55&5&5%	
2d grade Norway Axle, 1/4 & 5-16.....65&5%	
Superior Axle Clips.....60&5@70%	
Norway Spring Bar Clips, 5-16.....80&5&5%	
Wrought Iron Felloe Clips.....# 1, 6%	
Steel Felloe Clips.....# 2, 6%	
Baker Axle Clip.....# 1, 6%	

Cloth and Netting, Wire—

—See Wire, &c.

Cockeyes.....50%**Cocks Brass—**

Hardware list (Globe, Kerosene, Lever Bibbs, Racking, &c.).....60&2@60&10

Coffee Mills—See Mills, Coffee.**Collars Dog—**

Chapman Mfg. Company, new list.....40%

Medford Fancy Goods Co.....40&10&50%

Embossed, Gift, Pope & Stevens' list.....30&1%

Leather, Pope & Stevens' list.....40%

Brass, Pope & Stevens' list.....40%

Combs, Curry—

Fitch's.....10&10@50&10&10%

Rubber, per doz.....10.00.....25%

American Curry Comb Co.....33&40%

Kohler's Magic Oscillating.....# doz., \$2.00

Kohler's Humane.....# doz., \$1.75

Compasses, Dividers, &c.

Compasses, Calipers, Dividers, 70@70&10%

Bemis & Call Co.'s.....65%

Dividers.....50&5%

Calipers, Inside or Outside.....65%

Calipers, Wing.....60%

Calipers, Double.....65%

Calipers, Call's Patent Inside.....55%

Excelsior.....25&10%

Stevens & Co.'s.....25&10%

Starrett's Spring Calipers and Dividers.....25&10%

Lock Calipers and Dividers.....25%

Combination Dividers.....25%

Coolers, Water—

S. S. & Co.: 2-gal., \$2.00; 3-gal., \$2.50; 4-gal., \$2.75; 6-gal., \$3.40 each.....33&5%

Coopers' Tools—

—See Tools, Coopers'.

Cord—**Sash—**

Common.....# 1, 8 1/2@9 1/2

Patent, good quality.....# 1, 10@11 1/2

White Cotton, braided, fair.....# 1, 23@24 1/2

Common Russia Sash.....# 1, 12 1/2@13 1/2

Patent Russia Sash.....# 1, 13 1/2@14 1/2

Cable Laid Italian Sash.....# 1, 19@20 1/2

India Cable Laid Sash.....# 1, 11 1/2@12 1/2

Silver Lake.....

A quality, White, 50#.....25%

A quality, Drab, 50#.....25%

B quality, White, 30#.....10%

B quality, Drab, 30#.....10%

Sylvan Spring, Extra Braided, White, 34#.....34%

Sylvan Spring, Extra Braided, Drab, 39#.....39%

Semper Idem, Braided, White, 27#.....27%

Egyptian, India Hemp, Braided, 26#.....26%

Massachusetts, White, 29#.....29%

Samson.....

Braided, White Cotton.....# 1, 37#

Braided, Drab Cotton.....# 1, 42#

Braided, Italian Hemp.....# 1, 40#

Braided, Linen.....# 1, 66#

Tate's Solid Braided.....

Hercules, White.....# 1, 25%

Hercules, Drab.....# 1, 30%

Economy, Drab.....# 1, 27%

Economy, White.....# 1, 22%

Ossawan Mills.....

Braided, Glant, White, # 1 30#.....20%

Braided, Glant, Drab and Fancy, # 1 30#.....10%

Braided, Crown White, # 1 50#.....50%

Braided, Crown Drab and Fancy, # 1 30#.....30%

Wire Picture—

Braided or Twisted.....80&5@80&15%

Corkscrews—See Screws, Cork.**Corn Knives and Cutters—**

—See Knives, Corn.

Crackers Nut—

Table (H. & B. Mfg. Co.).....40%

Blake's Pattern, # doz., \$2.00.....10%

Turner & Seymour Mfg. Co.....50%

Acme.....70&10%

Japanned, # gro., \$30.....50%

Nickel Plated, # gro., \$30.....10%

Cradles—

Grain.....50&2@50&5&5%

Crays—

White Crays, # gross.....7@8#

D. M. Stewart Mfg. Co.....\$1.75.....25%

Meal Workers' # gross, \$1.75.....25%

Rolling Mill, # gross, 2.50.....25%

Railroad, # gross, 2.00.....25%

Soapstone Pencils, # gross, 1.00.....25%

See also Chalk.

Creamery Pails—See Pails, Creamery.**Crow Bars—See Bars, Crow.****Curry Combs—**

—See Combs, Curry.

Curtain Pins—

—See Pins, Curtain.

Cutters—**Meat—**

Dixon's, # doz.....40@40&5%

Nos. 1 2 3 4.....

\$14.00 \$17.00 \$19.00 \$30.00

Woodruff's, # doz.....40@40&5%

Nos. 100 150.....

\$15.00 \$18.00.....

Hale's, # doz.....11 12 17%

Nos. 1 2 3 4.....

\$27.00 \$33.00 \$45.00.....

American.....30%

Nos. 1 2 3 4.....

Each.....\$5 \$7 \$10 \$25 \$50 \$80

Enterprise.....25%

Nos. 10 12 22 32 42.....

Each.....\$3 \$5 \$8 \$10 \$15

Little Giant, # doz.....40&10@50%

Nos. 305 310 312 320 322.....

\$35.00 \$48.00 \$44.00 \$72.00 \$88.00

Triumph No. 505, # doz., \$21.00.....25@30%

Miles' Challenge, # doz.....45&45&10%

Nos. 1 2 3.....

Home No. 1, # doz., \$22.00 \$30.00 \$40.00

Draw Cut, each.....\$5&10%

Nos. 5 2 6 8.....

\$50 \$75 \$80 \$225.....20@25%

Beef Shavers (Enterprise).....20%

Chadborn's Smoked Beef Cutter, # doz., \$66.00

Slaw and Kraut—

Tucker & Dorsey Mfg. Co.....

Slaw Cutters, 1 Knife, # gross.....\$21.00

Slaw Cutters, 2 Knife, # gross.....30.00

Kraut Cutters.....40%

Tobacco—

Champion.....20&10@30%

All Iron.....# doz., \$4.25

Nashua Lock Co.'s, # doz., \$18.00, 50@55%

Whit's.....# doz., \$24.00, 55%

Sargent's.....# doz., \$20.00, 40%

Acme.....# doz., \$20.00, 40%

Washer—

Smith's Pat.....# doz., \$12.00, 20@10&10%

Johnson's.....# doz., \$11.00, 33&4%

Penny's, # doz., \$14; Jap'd, \$16, 55%

Appleton's.....# doz., \$18.00, 60&10%

Bonney's.....# doz., \$30.00, 30&10%

Cincinnati.....# doz., \$25.00, 25&10%

Diggers, Post Hole, &c.—

Samson, # doz., \$34.00.....25@25&10%

Fletcher Post Hole Augers, # doz., \$36.00, 20@20&10%

Eureka Diggers.....# doz., \$12.00@13.00

Vaughan's Post Hole Auger, # doz., \$8.50@9.50

Kohler's Little Giant.....# doz., \$18.00

Kohler's Hercules.....# doz., \$12.00

Kohler's Invincible.....# doz., \$12.00

Kohler's New Champion.....# doz., \$8.00

Scheidler.....# doz., \$18.00

Cronk's Post Bars, # doz., \$60.00, 50&5@50&10%

Gibb's Post Hole Digger.....# doz., \$15.00

Gibb's National.....# doz., \$12.00

Gibb's Columbia.....# doz., \$13.00

Gibb's Imperial.....# doz., \$7.50

Shlimer's Hollow Handle.....# doz., \$24.00, 50%

Gem, Improved # doz., \$9.00@10.00 net

Dividers—See Compasses.**Dog Collars—See Collars, Dog.****Door Checks—**

—See Checks, Door.

Door Springs—

—See Springs, Door.

Drawers.

Money, # doz.....\$13@20

Waddell's Improved, # doz.....\$15.00

Drawing Knives—

—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each \$1.75

Blacksmiths' Self-Feeding, each \$7.50, 20%

Preast, P. S. & W.....40&10%

Preast, Wilson's.....30&5%

Preast, Millers Falls.....each \$3.00, 25%

Preast, Bartholomew's.....each \$2.50, 25&10@40%

Ratchet, Merrill's.....20@20&5%

Ratchet, Ingersoll's.....25%

Ratchet, Parker's.....20@20&5%

Ratchet, Whitney's.....20&10%

Ratchet, Weston's.....20@25%

Ratchet, Moore's Triple Action.....25@30%

Ratchet, Curtis & Curtis.....30%

Whitneys Hand Drill, Plain, \$11.00, Adjustable, \$12.00.....20&10%

Automatic Boring Tools.....\$1.75@1.85

Chicopee Automatic Drill.....20&10%

Goodell Automatic Drills.....40&5%

Twist Drills—

Cleveland.....60&10&10%

Diamond, W. & B.....60&10&10%

Graham's Pat. Groove Shank.....60&10&10%

Morse.....60&10&10%

New Process.....60&10&10%

Standard.....60&10&10%

Syracuse (Metal list).....60&10%

Drill Bits or Bit Stock

Drills—See Augers and Bits.

Drill Chucks—See Chucks.

Halters—

Cover's Rope, Jute.....60¢10¢10¢2¢
 Cover's Rope, 7-16-in. Jute.....70¢2¢
 Cover's Rope, 1/2-in. Hemp.....60¢2¢
 Cover's Adj. Rope Halters.....40¢2¢
 Cover's Hemp Horse and Cattle Tie.....50¢2¢

Hammers—

Cover's Jute Horse Ties.....70¢10¢2¢
 Cover's Jute Cattle Ties.....70¢10¢2¢
 Cover's Adj. Web Halters.....35¢2¢3¢
 Cover's Saddlery Works Halters.....35¢2¢
 Cover's Saddlery Works Horse and Cattle Ties.....35¢2¢
 Cover's Saddlery Works Handy Web Halters.....35¢2¢

Handled Hammers—

Maydole's, list Dec. 1, '85.....25¢10¢35¢
 Buffalo Hammer Co.....50¢10¢
 Humason & Beckley.....50¢10¢
 Atha Tool Co.....40¢10¢
 Verree.....40¢10¢
 Fayette R. Plumb.....40¢10¢
 Artisan's Choice, A. E. Nail.....40¢10¢
 Regular Y. & P. A. E. Nail.....50¢
 Horseshoe Turning Hammers.....50¢10¢
 Other Hammers.....50¢10¢
 Cheney's Claw.....40¢10¢
 Cheney's Machine & Riveting.....50¢2¢
 Magnetic Tack, Nos. 1, 2, 3, 1.50 & 1.75.....30¢10¢
 Nelson Tool Works.....40¢10¢
 Warner & Nobles, new list.....25¢10¢
 Peck, Stow & Wilcox.....35¢40¢
 Sargent's.....40¢10¢10¢

Heavy Hammers and Sledges—

3 lb and under.....75¢10¢75¢10¢
 3 to 5 lb.....85¢
 Over 5 lb.....85¢
 Wilkinson's Smiths.....10¢11¢11¢

Handcuffs and Leg Irons—

See Police Goods.

Handles—

Cross-Cut Saw Handles—
 Atkins' new list.....40¢
 Champion.....15¢
 Ely's Perfection.....40¢
 Sensible.....40¢

Iron, Wrought or Cast—

Door or Thumb.....
 Nos. 1, 2, 3, 4.....
 Per doz.....\$0.90 1.00 1.08 1.85 1.50
 Roggin's Latches.....40¢10¢10¢
 Bronze Iron Drop Latches.....40¢70¢
 Jap'd Store Door Handles—Nuts, 1.62;
 Plate, 1.10; no plate, 0.88.....net
 Barn Door.....40¢10¢
 Chest and Lifting.....70¢70¢10¢

Wood—

Saw and Plane.....40¢10¢50¢
 Hammer, Hatchet, Axe, &c.....40¢40¢2¢
 Bradawl.....40¢2¢
 Hickory Firmer Chisel, large.....50¢
 Hickory Firmer Chisel, large.....50¢
 Apple Firmer Chisel, large.....50¢
 Apple Firmer Chisel, large.....50¢
 Socket Firmer Chisel, ass'd.....50¢
 Socket Framing Chisel, ass'd.....50¢
 J. B. Smith & Co.'s Pat. File.....50¢
 File, assorted.....50¢
 Auger, assorted.....50¢
 Auger, large.....50¢
 Pat. Auger, Ives'.....30¢10¢
 Pat. Auger, Douglass.....50¢10¢
 Pat. Auger, Swan's.....50¢10¢
 Hoe, Rake, Shovel, &c.....60¢80¢5¢

Hangers—

Barn Door, old patterns.....70¢70¢5¢
 Barn Door, New England.....70¢70¢5¢
 Samson Steel Anti-Friction.....55¢
 Orleans Steel.....55¢
 Hamilton Wrought Steel Track.....55¢
 Champion.....60¢10¢
 Climax Anti-Friction.....55¢
 Zenith for Wood Track.....55¢
 Sterling.....50¢10¢60¢
 Victor, No. 1, \$15.00; No. 2, \$16.50; No. 3, \$18.00.....50¢2¢
 Kidder's.....50¢50¢10¢
 Boss.....50¢10¢10¢5¢
 Best Anti-Friction.....50¢10¢
 Duplex (Wood Track).....50¢10¢5¢
 Terry's Modern.....50¢10¢50¢10¢5¢
 Terry's Ideal.....50¢10¢50¢10¢5¢
 Terry's Solid.....50¢10¢60¢
 Terry's Shield.....50¢10¢60¢
 Terry's Wrought Single Strap.....50¢10¢
 Cronk's Patent Steel Covered.....50¢10¢
 Carrier Steel Anti-Friction.....50¢10¢
 Richards.....30¢30¢10¢
 Lane's New Standard.....50¢50¢5¢
 Lane's Standard.....50¢50¢10¢10¢
 Lane's Parlor.....40¢
 Warner's Pat.....20¢10¢10¢
 Stearns' Anti-Friction.....25¢10¢10¢
 Cincinnati Nos. 1, \$2.25; 3, \$2.60; 4, \$2.60.....20¢10¢
 Paragon Nos. 5, 5 1/2, 7 and 8.....20¢10¢
 Crescent.....20¢10¢
 Nickel Steel, Nos. 0, \$25; 1, \$30; 2, \$35.....40¢10¢60¢
 Chicago Anti-Friction.....30¢10¢
 Star.....50¢
 Barry.....50¢
 Interstate.....50¢10¢60¢
 Pendulum, Payson's.....40¢40¢10¢
 Moody.....45¢
 Economy, \$6.00.....50¢10¢
 Perfection.....50¢10¢50¢10¢5¢
 Lundy, Steel Parlor.....40¢
 Matchless.....50¢10¢
 Magic.....45¢10¢
 Wild West.....45¢10¢
 Moore's Elevator.....35¢
 Moore's Baggage Car Door.....35¢
 Moore's Railroad.....55¢

Harness Snaps—See Snaps.**Hatchets—**

American Axe and Tool Co.....
 Hunt's.....40 & 10
 Hurd's.....40 & 10
 Maun's.....40 & 10
 Peck's.....40 & 10
 Underhill's.....40 & 10
 Fayette R. Plumb.....
 C. Hammond & Son.....
 Kelly's.....
 Buffalo Hammer Co.....50 & 50
 Sargent's & Co.....50 & 50
 P. S. & W. Co.....50 & 50
 Schulte, Lohoff & Co.....
 Ten Eyck Edge Tool Co.....
 Collins.....

Hay and Straw Knives—

See Knives.

Hinges—**Blind Hinges—**

Parker.....75¢75¢10¢
 Huffer.....50¢
 Clark's Nos. 1, 3, 5, 40 and 60.....80¢5¢80¢10¢
 Clark's Mortise Gravity.....50¢
 Sargent's Nos. 1, 3, 5, 11, 12, 13, 75¢75¢10¢
 Reading's Gravity.....75¢10¢75¢10¢5¢
 Shepard's.....75¢10¢
 Noiseless.....80¢
 Niagara.....80¢
 Buffalo.....80¢
 Clark's Genuine Pattern.....75¢10¢
 O. S., Lull & Porter.....75¢10¢
 Acme, Lull & Porter.....75¢
 Queen City Reversible.....70¢10¢5¢75¢
 Clark's, Lull & Porter, Nos. 0, 1, 1 1/2, 2 1/2, 3.....75¢10¢2¢4¢
 North's Automatic Blind Hinges, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50.....10¢

Gate Hinges—

Western.....40¢
 N. E.....40¢
 N. E. Reversible.....40¢
 Clark's, Nos. 1, 2, 3.....40¢
 N. Y. State.....40¢
 Automatic.....40¢
 Shepard's.....40¢

Spring Hinges—

Geer's Spring and Blank Butts.....40¢
 Union Spring Hinge Co.'s list.....
 March, 1886.....
 Barker's Double Acting.....25¢
 Union Mfg. Co.....25¢
 Bommer's Japanned.....35¢
 Bommer's All other Kinds.....30¢
 Buckman's.....15¢20¢
 Chicago.....30¢
 Bardley's Patent Checking.....15¢
 Acme.....25¢10¢
 Empire and Crown.....20¢
 Hero and Monarch.....55¢
 American, Gem and Star.....20¢
 Oxford.....20¢
 Royal.....60¢4¢
 Reliable.....60¢
 Champion.....60¢
 No. 10 Matchless.....60¢
 No. 25 Unbreakable.....60¢
 J. G. C. Covered, 3 gro., \$30.....50¢2¢
 Samson.....60¢4¢7¢
 Wiles, No. 1, 3 gro., \$16; No. 2.....13¢
 Devore, No. 1.....30¢
 Rex.....30¢
 Trepo.....30¢
 New Idea Nos. 1 and 10.....30¢
 New Idea Dbl. Acting.....45¢
 Ideal No. 3.....30¢
 Stearns' Noiseless Floor Hinge, 3 set, \$5.00.....20¢10¢30¢

Wrought Iron Hinges—

List February 14, 1891.
 Strap and T.....50¢10¢50¢10¢10¢
 Corrugated Strap and T.....50¢10¢5¢
 Screw Hook and.....14 to 20 in. 3¢
 Strap.....22 to 36 in. 7¢
 Screw Hook and Eye.....14 in. 7¢
 16 in. 7¢
 18 in. 7¢
 Rolled Blind Hinges, Nos. 32 and 34.....50¢10¢
 Rolled Blind Hinges, Nos. 232 and 234.....50¢10¢
 Rolled Plate.....70¢10¢
 Rolled Raised.....70¢10¢
 Plate Hinges 8, 10 & 12 in. 5¢
 "Providence" over 12 in. 4¢

Hoes—**Eye—**

D. & H. Scovill.....20¢
 Lane's Crescent, Planters' Pattern.....45¢5¢
 Lane's Razor Blade, Scovill Pattern.....30¢
 Maynard, S. & O. Pat.....45¢5¢
 Sandusky Tool Co., S. & O. Pat.....60¢5¢
 Pat.....60¢10¢
 Chattanooga Tool Co., S. & O. Pat.....60¢10¢
 Grub.....60¢10¢

Handled—

Garden, Mortar, &c.....70¢70¢5¢2¢
 Planter's, Cotton, &c.....70¢70¢5¢2¢
 Warren Hoe.....60¢80¢5¢
 Magic.....40¢40¢

Hog Rings and Ringers—

See Rings and Ringers.

Holisting Apparatus—

See Machines, Hoisting.

Hollow Ware—

See Ware, Hollow.

Holders—**Bag—**

Sprengle's Pat.....40¢18¢60¢

Bit—

Extension.....40¢40¢10¢
 Ives, 3 doz \$20.00.....60¢5¢60¢10¢
 Diagonal.....40¢24¢40¢
 Angular.....40¢24¢40¢

File and Tool—

Bals Pat.....40¢40¢
 Nicholson File Holders.....20¢

Sash—

Motley's Adj. Sash, Medium Size.....40¢1.20, 40¢

Hooks—**Cast Iron—**

Bird Cage, Sargent's List.....60¢10¢10¢
 Bird Cage, Reading.....60¢10¢10¢
 Clothes Line, Sargent's List.....70¢
 Clothes Line Moore's.....70¢

Clothes Line, Reading list.

Celling, Sargent's list.....55¢10¢55¢10¢10¢
 Harness, Reading list.....55¢10¢55¢10¢10¢
 Coat and Hat, Sargent's list.....55¢10¢60¢10¢
 Coat and Hat, Reading.....50¢10¢50¢10¢10¢
 Coat and Hat, Moore's.....70¢

Wrought Iron—

Cotton.....40¢
 Cotton Pat. (N. Y. Mallet and Handle).....40¢
 Wks.....30¢
 Tassel and Picture, T. & S. Mfg. Co.....60¢
 Wrought Staples Hooks, &c.....See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60¢60¢10¢
 Wire Coat and Hat, Miles, list April, 1886.....50¢50¢10¢
 Indestructible Coat and Hat.....45¢45¢5¢
 Wire Coat and Hat, Standard.....50¢10¢60¢
 Handy Hat and Coat.....50¢10¢60¢
 Steady Ceiling Hooks.....50¢10¢60¢
 Belt.....80¢16¢80¢20¢
 Atlas, Coat and Hat.....55¢
 Williamson's Bird Cage Hooks, list April, 1892.....40¢
 Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, \$2.00; No. 3, \$2.10; No. 4, \$2.25
 Nolin's Grass.....40¢
 Bush.....55¢60¢
 Whitetree Patent.....55¢
 Hooks and Eyes—Malleable Iron.....70¢70¢10¢
 Hooks and Eyes—Brass.....60¢10¢10¢
 Bench Hooks—See Bench Stops.

Horse Nails—See Nails, Horse**Horse Shoes—**

See Shoes, Horse.

Hose, Rubber—

Competition, Fair quality.....75¢75¢10¢
 Competition, Low Grade.....80¢80¢10¢
 Standard.....60¢10¢60¢10¢10¢
 Extra.....60¢10¢60¢10¢10¢
 N. Y. B. & P. Co., Para.....25¢5¢
 N. Y. B. & P. Co., Extra.....40¢5¢50¢
 N. Y. B. & P. Co., Dundee.....80¢60¢5¢
 Cotton Garden, 3/4 in. coupled.....7¢
 Fair Quality, 1/2 in. coupled.....8¢

Huskers—

Blair's Adjustable.....40¢
 Blair's Adjustable Clipper.....40¢
 Hubbard's Solid Steel.....45¢

Indurated Fiber Ware—

See Ware, Indurated Fiber.

Irons.**Sad—**

From 4 to 10, at factory.....100 lb.
 Self-Heating.....40¢
 Blair's Heating Taper.....40¢
 Mrs. Potts' Sad Irons, per set:
 No. 50.....60¢
 No. 55.....60¢
 No. 60.....60¢
 No. 65.....60¢
 No. 70.....60¢
 No. 75.....60¢
 No. 80.....60¢
 No. 85.....60¢
 No. 90.....60¢
 No. 95.....60¢
 No. 100.....60¢
 Small lots.....90¢
 Crown Improved.....60¢10¢
 Ideal Irons, new list.....50¢10¢50¢10¢10¢
 Salamander Irons.....25¢
 E. B. Sad Irons.....30¢
 Chinese Laundry (N. Y. B. & P. Co.).....15¢
 New England.....5¢
 Mahony's Troy Pol. Irons.....25¢
 Sensible, list Jan. 91.....50¢10¢5¢
 Sensible Tailor's Irons.....30¢
 National Self-Heating.....30¢

Soldering—

Soldering Coppers.....40¢
 Cover's Adjustable, list Jan. 1, 1886.....35¢2¢
 Tinker's Dread.....40¢1.75; 7 gro. 1.8

Pinking—

Pinking Irons, 3 doz., 55¢60¢.

Jack Screws—See Screws.**Jacks, Wagon—**

Daisy.....33¢4¢
 Victor.....33¢4¢
 Lockport.....40¢

Kettles—

Brass, Spun, Plain, list Jan. 1, '91, 25¢5¢
 Brass, Spun, Plid. W. M. list Jan. 1, '91, 20¢
 Stamped Brass Kettles.....7¢2¢
 Enameled and Tea—See Ware, Hollow.

Keys—

Lock Ass'n list Dec. 30, 1886, 65¢10¢70¢
 Eagle, Cabinet, &c.....33¢4¢2¢
 Hotchkiss' Brass Blanks.....40¢
 Hotchkiss' Copper and Tinned.....40¢
 Hotchkiss' Pad. and Cab.....35¢
 Wollensack Tinned.....60¢10¢

Knife Sharpeners—

See Sharpeners, Knife.

Knives—**Butcher, Shoe, &c.**

Wilson's Butcher Knives, list Dec. 8, 1890.....25¢
 Ames' Butcher Knives.....25¢
 Foster Bros' Butcher, &c.....40¢
 Jordan's A. A. Butcher's, list.....40¢10¢
 Nichols' Butcher Knives.....40¢10¢
 W. W. Wilson, Butcher, 6 in., \$2.00; 7 in., \$2.70; 8 in., \$3.80, &c.....25¢30¢
 Ames' Bread Knives, 4 doz \$1.50, 15¢20¢
 Moran's Shoe and Bread.....20¢20¢10¢
 Hay and Straw—See Hay Knives.

Corn—

Bradley's.....10¢
 Wadsworth's.....25¢25¢10¢

Drawing—

Witherby.....75¢75¢10¢5¢
 P. S. & W.....75¢75¢10¢5¢
 Mix.....75¢75¢10¢5¢
 New Haven.....75¢75¢10¢5¢
 Merrill.....60¢10¢60¢10¢5¢
 Douglass.....75¢75¢10¢5¢
 Watrous.....15¢10¢25¢

L. & J. White.....20¢5¢
 Bradley's.....35¢
 Adjustable Handle.....25¢33¢4¢
 Wilkinson's Folding.....25¢25¢5¢

Hay and Straw—

Lightning, from jobbers.....\$8.00@9.00
 Wadsworth's.....40¢7¢40¢10¢
 Carter's Needle.....40¢11¢11¢
 Heath's.....40¢13¢13¢50¢
 Nolin's Hay.....40¢7.00@8.00

Mincing—

Am. (2d quality), 7 gr., 1 blade, \$7
 2 blades, \$12; 3 blades, \$18.....net
 Lathrop's.....20¢10¢
 Smith's, 7 doz., Single, \$2; Double \$4.....45¢50¢
 Knapp & Cowles.....50¢10¢60¢
 Buffalo Adjustable.....40¢3.00, 33¢4¢

Knobs—

Door, Mineral.....60¢65¢
 Door, Por. Jap'd.....70¢75¢
 Door, Por. Nickel.....2.00@2.25
 Door, Por. Plated Nickel.....2.00@2.25
 Drawer, Porcelain.....60¢10¢60¢10¢0¢
 Hemacite Door Knobs.....40¢10¢50¢
 Yale & Towne Wood, list Dec., 1885, 40¢
 Base, Rubber Tip.....70¢10¢5¢
 Picture, Judd's.....60¢10¢10¢70¢
 Picture, Sargent's.....70¢10¢
 Picture, Hemacite.....35¢5¢
 Shutter, Porcelain.....65¢10¢
 Carriage, Jap.....40¢80¢60¢10¢
 Bardsley's Wood Door, Shutter, &c.....15¢

Ladders.

Davies Extension and Single.....20¢5¢

Ladders—

Melting, Sargent's.....60¢60¢5¢
 Melting, Reading.....35¢10¢
 Melting, P. S. & W.....35¢10¢40¢
 Melting, Warner's.....30¢

Lanterns—**Tubular—**

Regular, with Guard.....40¢3.50
 O. K. with Guard.....40¢3.75
 Side Lift, with Guard.....40¢4.00
 Square Lift, with Guard.....40¢4.25
 Anti-Friction, with Guard.....40¢4.5
 Brass Plated, Sq. Lift, Guard.....40¢5.5
 Cop. Plated, Sq. Lift, Guard.....40¢5.5

Bull's Eye Police—

2 1/2-inch regular.....40¢3.60
 3-inch regular.....40¢3.90
 2 1/2-inch flash light.....40¢4.00
 3-inch flash light.....40¢4.50

Lawn Mowers—

See Mowers, Lawn.

Leaders, Cattle—

Humason, Beckley & Co.'s.....70¢
 Sargent's.....70¢10¢70¢10¢10¢
 Hotchkiss.....30¢
 Peck, Stow & W. Co.....60¢10¢

Lemon Squeezers—

See Squeezers, Lemon.

Lifters, Transom—

Wollensack's:
 Class 3 and 4, Bronzed Iron.....60¢
 Class 3 and 4, Bronze Metal.....50¢
 Class 3 and 4, Brass.....50¢
 Skylight Lifters.....30¢
 Reiter's, list Feb. 20, 1891.....60¢60¢10¢
 Bronzed Iron Rods.....60¢60¢10¢
 Brass, Real Bronze or Nickel Plate.....30¢
 Excelsior.....50¢10¢2¢
 Shaw's.....50¢10¢
 Payson's:
 Universal.....60¢
 Solid Grip.....60¢10¢60¢10¢10¢
 Imperial.....50¢10¢

Lines—

Cotton and Linen Fish.....50¢
 Chalk.....60¢
 Mason's Linen, 3/4 ft., No. 1, \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4, \$2.75; No. 5, \$3.25.....25¢
 Cotton Chalk.....55¢
 Samson Cotton, No. 4, \$2; No. 4 1/2, \$2.50.....40¢
 Silver Lake, Braided No. 0, \$6.00; No. 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50.....25¢
 gro.....25¢
 Mason's Linen, No. 3 1/2, \$1.50; No. 4, \$2.00; No. 4 1/2, \$2.50.....45¢
 Mason's Colored Cotton.....15¢
 Wire Clothes, Nos. 18 10 20.....45¢
 100 ft.....\$3.50 \$3.00 \$2.50
 Ventilator Cord, Samson Braided, White or Drab Cotton, 7 doz \$7.50, 20¢
 Ossavan Mills, Chalk, Twisted, 60¢; Chalk, Soft Braided, 50¢ Chalk, Braided, 25¢.

Links, Open—

Terry's—per gro.:
 Nos. 1 2 3 4
 \$8.00 8.00 12.00 10.00

Locks, &c.—**Cabinet—**

Eagle, Gaylord Par. } list, March '84, rev.
 ker and Corbin.....Jan. 1, '85, 33¢4¢2¢
 Delta, Nos. 30 to 39.....40¢
 Delta, Nos. 51 to 63.....40¢10¢
 Delta, Nos. 87 to 99.....30¢
 Champion Night Latches.....40¢
 Barnes Mfg. Co.....40¢40¢10¢
 Eagle and Corbin Trunk.....25¢15¢
 Champion Cab. and Combin.....33¢4¢
 Yale.....net prices
 Romer's.....25¢

Door, Locks, Latches, &

Britain, Graham & Mathes, list Jan. 1890. 60&10&10%
Plate 33&10&10%
Barnes Mfg. Co. 40&10&10%
Yale 30%
Deitz Flat Key 30%
Romer's Night Latches 50&10%
Brooklyn Latches 50&10%
Warner's Burglar Proof. 30% doz. \$3.00, 50%

Elevator—

Moore's. 33&10%
List June 10, 1891. 50&2%

Padlocks—

Norwich Lock Mfg. Co., old list. 50&2%
Yale Lock Mfg. Co.'s. 40&10%
Eagle 40%
Eureka, Eagle Lock Co. 40&2%
Romer's Nos. 0 to 91. 30%
Romer's Scandinavian, &c., Nos. 100 to 605. 15%
A. E. Deitz 40%
Champion Padlocks. 40%
Hotchkiss. 30%
Star 60%
Horseshoe. 30%
Barnes Mfg. Co. 40&10&10%
Nock's 30%
Scandinavian. 60&10%
E. T. Frahm's Keystone Scandinavian. 10%
1010 line. 90&40%
120 line. 90&25%
109 line. 65%
510 line. 70&10%
225, 610 and 209 lines. 50%
All other numbers. 50%
Ames Sword Co. up to No. 160. 40%
Ames Sword Co. above No. 160. 50%
Slaymaker, Barry & Co. 80%
No. 1010 line. 90&5%
No. 41 line. 50%
No. 61 line. 80%
No. 21 line. 80%

Sash, &c.—

Clark's No. 1, \$10; No. 2, \$8 gr. 33&10%
Ferguson's. 33&10%
Victor 60&10&10%
Walker's 25&33&10%
Attwell Mfg. Co. 25&33&10%
Reading 60&10&10%
Hammond's Window Springs. 40%
Common Sense, Jap'd, Cop'd and Br'd. gr \$4.00
Common Sense, Nickel Plated. gr \$4.00
Universal 30%
Kempshall's Gravity. 60%
Kempshall's Model. 60&10&10%
Corbin's Daisy, list Feb. 15, 1888. 70%
Payson's Perfect. 60&10&10%
Huganin's Sash Balances. 25&33&10%
Huganin's New Sash Locks. 25&33&10%
Ives' Patent. 60&10&10%
Fish (Liesche's pat.), No. 100, gr. \$8. 50%
No. 105, gr. \$10. 50%
Davis Bronze, Barnes Mfg. Co. 60%
Champion Safety list January, 1893. 70&5%
Security 70%
Giant, list Jan. 1892. 70&5%
Wolcott's. 60&10&10%
Monarch 50%

Lumber Tools—

See Tools, Lumber.
Lustro—
Four-ounce bottles. 30% doz, \$1.75; 30% gross \$17.00

Machines.

Boring—

Without Augers. Upright. Angular.
Douglas. \$5.50 \$6.75. 50%
Snell's, Rice's Pat. 5.50 6.75. 50&10%
Jennings'. 5.50 6.75. 50&10%
Other Machines. 2.25 2.50. 25%
Phillip's Patent
With Auger. 7.00 7.50. 25%
Millers Falls. 7.50. 25%
Boss, Carpenter's. 3.80
Boss, Ship Bldrs'. 3.85

Fluting—

Knox, 4 1/2-inch Rolls. \$3.25 each } 35%
Knox, 6-inch Rolls. \$3.60 each }
Eagle, 3 1/2-inch Rolls. \$2.15. 35%
Eagle, 6-inch Rolls. \$2.35. 35%
Crown, 4 1/2 in. \$3.50; 6 in. \$4.00; 8 in. \$4.50 each. 35%
Crown Jewel, 6 in. \$3.50 each. 35%
American, 5 in. \$3.00; 6 in. \$3.40; 7 in. \$4.50 each. 35%
Domestic Fluter, White Metal. 1.50
Geneva Hand Fluter, 1 1/2 in. \$12. 25%
Crown Hand Fluter, No. 1, \$15.00; 2, \$12.50; 3, \$10.00; 4, \$8.25. 30%
Shepard Hand Fluter, No. 85, per doz \$15.50. 40%
Shepard Hand Fluter, No. 110, 1 doz \$11.00. 40%
Shepard Hand Fluter No. 95, 1 doz \$3.00. 40%
Combined Fluter and Sad Iron. 30%
1 doz \$15.00. 30%

Holting—

Moore's Hand Holst, with Lock Brake. 20%
Moore's Anti-Friction Differential Pulley Block. 20%
Moore's Rope Differential Pulley Block. 60%
Energy Mfg. Co.'s. 25%
See also Blocks.

Washing—

Anthony Wayne, 1 doz, No. 1, \$42; No. 2, \$45; No. 3, \$48. 30%
Wayne American. 30%
Western Star 1 doz, No. 2, \$36; No. 3, \$39. 30%
Weissell. 30%
Fair and Square. 30%
1 doz \$42.00

Mallets—

Hickory 20&10&10%
Lignumvita 20&10&10%
B. & L. Block Co., Hickory & L. V. 30&10%
Mattocks—Regular list. 60&10&10%
Measures—

Standard Fibreware, No. 1, peck 30%
dozen, \$3.50; 1/2-peck, \$3.00

Meat Cutters—
See Cutters, Meat.
Menders, Harness—
Per doz. \$2.00

Milk Cans—See Cans, Milk.

Mills—

Coffee—
Box and Side, list Jan. 1, 1888. 60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893. 20%
The Swift, Lane Bros. 30%
Waddell's New Box Mills, Ideal Brand, New List. 60%

Mincing Knives—

See Knives, Mincing.

Molasses Gates—

See Gates, Molasses.

Money Drawers—

See Drawers, Money.

Mowers, Lawn—

Best Machines: 10-in., \$4; 12-in., \$4.50; 14-in., \$5; 16-in., \$5.50; 18-in., \$6.
Low-Grade Machines: 10-in., \$3; 12-in., \$3.25 14-in., \$3.50 each

Muzzles—

Safety. 1 doz, \$3.00, 25%

Nails—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92. 85&5%
Hungarian, Finishing, Upholsterers', &c. See Tools.
Horse—
Nos. 6 7 8 9 10
American. 9 1/4 9 1/4 9 1/4 9 1/4. net
Ausable. 28 1/2 28 1/2 28 1/2 28 1/2 28 1/2. 40&5&2%

Clinton, Fin. 19 1/4 17 1/4 16 1/4 15 1/4 14 1/4. 30&5%
Essex. 28 1/2 28 1/2 28 1/2 28 1/2 28 1/2. 40&5&2%

Lyra. 9 1/4 1 9 1/4 9 1/4 9 1/4. net
Snowden. 9 1/4 1 9 1/4 9 1/4 9 1/4. net
Standard. 23 1/2 21 1/2 20 1/2 18 1/2 16 1/2. 35%
Vulcan. 23 1/2 21 1/2 20 1/2 18 1/2 16 1/2. 35%
Northwest'n. 23 1/2 23 1/2 22 1/2 21 1/2 20 1/2. 25&25&5%

C. B. K. 25 1/2 23 1/2 22 1/2 21 1/2 20 1/2. 40%
A. C. 25 1/2 23 1/2 22 1/2 21 1/2 20 1/2. 40&10%

Maud S. 25 1/2 23 1/2 22 1/2 21 1/2 20 1/2. 50&10&5%
Champlain. 28 1/2 26 1/2 25 1/2 24 1/2 23 1/2. 40&5&2%

Champion. 25 1/2 23 1/2 22 1/2 21 1/2 20 1/2. 40&5&2%
Capewell. 19 1/4 18 1/4 17 1/4 16 1/4 15 1/4. 10&10&10%
Aldrich. 23 1/2 21 1/2 20 1/2 18 1/2 16 1/2. 10%
Western. 23 1/2 21 1/2 20 1/2 18 1/2 16 1/2. 50%
Empire Bronzed. 13 1/4 14 1/4 15 1/4. 50%

Picture—

Brass Head, Sargent's list. 60&10&10%
Brass Head, Combination list. 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent. 40%

Nail Pullers—See Pullers, Nail.

Nail Sets—See Sets, Nail.

Nut Crackers—

See Crackers, Nut.

Nuts—List Dec. 18, 1889.

Hot Pressed. 3.50 6.50 off list
Cold Funches. 5.00 6.10 off list
In packages of 100 lb add 1-10%
net; in packages less than 100 lb, add 1/4% lb, net.
Oakum—
Best or Government. 1 doz 6 1/4 @ 7 1/4
U. S. Navy. 1 doz 6 1/4 @ 7 1/4
Navy. 1 doz 6 1/4 @ 7 1/4
Oil Tanks—See Tanks, Oil.
Oilers—
Zinc and Tin. 65&10&70&5%
Brass and Copper. 50&10&50&10&5%
Malleable, Hammer Improved, No. 1. \$3.50; No. 2, \$4.00; No. 3, \$4.40 1 doz. 10&10&5%
Malleable, Hammers' Old Pattern, same list. 45%
Prior's Pat. or "Paragon" Zinc. 50&10&10%
Prior's Pat. or "Paragon" Brass. 50%
Olmstead's Tin and Zinc. 60%
Olmstead's Brass and Copper. 50%
Broughton's Zinc. 60%
Broughton's Brass. 50%
Steel, Draper & Williams. 50%
Whitmot & Hobbs Mfg. Co., Steel Anti-Rust. 60%
Openers, Can—
Messenger's Comet. 1 doz \$3.00, 25%
American. 1 doz \$3.75, \$3.00
Dixey. 1 doz 25 1/2, 16 @ 20
Lyman's. 1 doz \$3.75, 20%
No. 4, French. 1 doz \$2.25, 50 @ 60%
No. 5, Iron Handle. 1 doz \$8.00, 45 @ 50%
Eureka. 1 doz \$2.50, 10%
Sardine Scissors. 1 doz \$2.75, \$3.00
Star. 1 doz \$2.75
Sprague, No. 1, \$2.00; 2, \$2.25; 3, \$2.50. 40%
Excelsior, No. 1 \$2.50; No. 2, \$1.50. 40%
World's Best 1 doz, No. 1, \$12.00. 40%
No. 2, \$24.00; No. 3, \$36.00. 50&10%
Universal, 1 doz \$3.00. 55&5%
Domestic, 1 doz \$2.00. 45%
Champion, 1 doz \$5.00. 50%
Moore's. 70%

Packing, Steam—

Rubber—
Standard, fair quality. 70&70&10%
Inferior quality. 75&80%
Extra. 80&80&5%
N. Y. B. & P. Co., Standard. 50%
N. Y. B. & P. Co., Empire. 60%
N. Y. B. & P. Co., Salamander. 25%
Jenkins' Standard, 1 doz 80. 25&25&5%

Miscellaneous—

American Packing. 10 1/4 11 1/4 12 1/4 13 1/4 14 1/4. 10%
Russia Packing. 13 1/4 14 1/4 15 1/4 16 1/4 17 1/4. 10%
Italian Packing. 13 1/4 14 1/4 15 1/4 16 1/4 17 1/4. 10%
Cotton Packing. 15 1/4 16 1/4 17 1/4 18 1/4 19 1/4. 10%
Jute. 17 1/4 18 1/4 19 1/4 20 1/4 21 1/4. 10%

Pails—

Creamery—
S. S. & Co.: 18-qt., \$7.00; 20-qt., \$7.25
1 doz. 5%

Galvanized—

Hill's Light Weight. 10 12 14
Hill's Heavy Weight. 10 12 14
Hill's No. 2. 10 12 14
Central Stamping Co. 10 12 14
Iron Clad. 10 12 14
Fire Buckets. 10 12 14
Buckets—See Well Buckets.

Indurated Fiber Ware

Star Pails, 12 qt. 1 doz \$4.20
Milk, 14 qt. 1 doz \$5.40
Stable, 14 qt. 1 doz \$6.00
Fire Pails, deep. 1 doz \$4.80
Fire Pails, round bottom. 1 doz \$5.40

Standard Fiber Ware—

Water Pails, 12 qt. 1 doz \$3.15 3.75
Dairy Pails, 14 qt. 1 doz 3.75 4.25
Fire Pails, No. 1, 12 qt. 1 doz 3.75 4.25
Sugar Pails. 4.50 6.00
Horse Pails. 4.50 6.00
Buggy Pails. 3.50 4.50
Slop Jars (bal. trap). 7.50 8.50
Chamber Pails, 14 qt. 6.00 7.00

Pans—

Dripping—
Small sizes. 1 doz 5 1/4
Large sizes. 1 doz 5 1/4
Silver & Co. (Covered). 40%

Fry—

Standard list: 1 2 3 4
No. 1. 0 1 2 3 4
1 doz. \$3.00 \$3.75 \$4.25 4.75 \$5.25
Polished, regular goods. 75&75&10%
Acme Fry Pans. 60&10%

Dust—

Steel Edge, No. 1. 1 doz \$1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, \$2; 20, \$2.25; 30, \$2.50 each. 60&10%

Paper and Cloth—

Sand and Emery—
List April 19, 1888. 60&10&50&10&10%
Sibley's Emery and Crocus Cloth. 30%

Parers—

Apple—
Advance. 1 doz \$4.75
Baldwin. 1 doz 5.25
Bonanza. 1 doz 5.25
Daisy. 1 doz 4.00
Dandy. 1 doz 7.50
Eclipse. 1 doz 4.00
Eureka, 1888. 1 doz 16.00
Family Bay State. 1 doz 12.00
Favor. 1 doz 5.00
Gold Medal. 1 doz 4.00
Ideal. 1 doz 4.00
Improved Bay State. 1 doz 27.00 @ 30.00
Little Star. 1 doz 4.50
Monarch. 1 doz 13.50
New Lightning. 1 doz 5.50
Onion. 1 doz 4.00
Perfection. 1 doz 3.00
Pomona. 1 doz 4.00
Pomona. 1 doz 4.00
Turn Table. 1 doz 4.50
Victor. 1 doz 13.50
Waverly. 1 doz 4.00
White Mountain. 1 doz 4.00
Reading 72. 1 doz 4.25
Reading 78. 1 doz 7.00

Potato—

White Mountain. 1 doz \$4.50
Antrim Combination. 1 doz \$5.50
Hoosier. 1 doz \$13.50
Saratoaga. 1 doz \$5.50

Pencils, Soapstone—

See Crayons.

Pickers, Fruit—

Prize Fruit Pickers. 50%

Picks—

Railroad or Adze Eye, 5 to 6, \$12.00; 6 to 7, \$13.00. 60&10&50&10&10%
Saratoga. 1 doz \$5.50

Picture Nails—

See Nails, Picture.

Pinking Irons—

See Irons, Pinking.

Pins—

Bow—
Humason, Beckley & Co.'s. 60&10%
Sargent & Co.'s, \$17 and \$18. 60&10%
Peck, Stow & W. Co. 50&10&50&10&5%
Escutcheon—
Iron, list Nov. 11, 1885. 50&10&50&10&5%
Brass. 60&10&50&10&5%

Pipe, Wrought Iron—

1 1/2 and under, Plain. list April 13, 1893. 57&10%
1 1/2 and under, Galv. 58&10%
1 1/2 and over, Plain. 67&10%
1 1/2 and over, Galv. 67&10%
Boiler Tubes, list Oct. 24, 1892. 65&10%
Casing, list Nov. 10, 1892. 52&10%
Inserted Joints Casing, list Nov. 10, 1892. 27&10%
Steel Boiler Tubes. 27&10%
Cold Drawn Seamless Steel Tubing. 50%

Planes and Plane Irons—

Wood Planes—
Molding. 40&10%
Bench, First quality. 55&10%
Bench, Second quality. 50&10%
Bailey's (Stanley R. & L. Co.). 50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.). 50&10%
Miscellaneous Planes (Stanley R. & L. Co.). 25&10%
Steers' Iron Planes. 50&10&5%
Meriden Mal. Iron Co.'s. 60&10&5%
Birmingham Plane Co. 60&10&5%
Gage Tool Co.'s Self-Setting. 20&10&10%
Chaplin's Iron Planes. 50&10&5%
Sargent's. 60&10&10%
Standard Tool Co. 50&10&5%

Plane Irons—

Butcher's. \$5.00 @ \$5.25 to \$5.00
Buck Bros. 50%

Auburn Thistle. 30&10&30&10&10%

Sanbury. 25%
L. & L. L. Co. 50&10%
Stanley R. & L. Co. 50&10%

Plates—

Felcoe. 1 doz 6 1/4 @ 6 1/4

Pilers and Nippers—

Button's Patent. 60%
Hall's No. 2, 5 in. \$13.50; No. 4, 7 in. \$21.00 1 doz. 40%
Humason & Beckley Mfg. Co. 50&10&10%
Lindsay's Giant. 33&10%
Gas Pliers, Custer's Nickel Plated. 40%
Eureka Pliers and Nippers. 40%
Russell's Parallel. 25%
P. S. & W. Cast Steel. 50&10&5%
P. S. & W. Timmers' Cutting Nippers. 10%
Carver's Cut Wire Cutters. 20%
Morrill's Parallel. \$12.00. 30&5%
Cronk's 3 in. \$15.00; 10 in. \$20.00
Cronk's Button Pattern. 50&10&10%
Cronk's Carrier Pliers. 60&10&5%

Plumbs and Levels—

Regular list. 75&10&75&10&10%
Stanley's Duplex. 20&10%
Stanley's Handy. 20&10%
Dixon's. 50%
Pocket Levels. 70&10&70&10&10%
Davis Iron Levels. 30%
Davis Incliniometers. 10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers. 1 doz. \$1.00; 2 doz, \$2.00. 33&10%
Silver & Co. 6-Ring. 1 doz, \$4.00; 3-Ring. 2.00

Pokes, Animal—

Bishop & I. K. L. 1 doz \$6.00
Bishop's Monarch. 1 doz \$4.50
Bishop's Pioneer. 1 doz \$4.00
Bishop's American. 1 doz \$3.00
Eagle, Double Stale. 1 doz \$5.75
Eagle, Single Stale. 1 doz \$3.75
Buckeye, Single Stale. 1 doz \$2.75
Bolding. 1 doz \$6.00
Metallic Horse Poke. 1 doz \$6.00

Police Goods—

R. I. Tool Co., Handcuffs, \$15.00 1 doz 10%
R. I. Tool Co., Leg Irons, \$25.00 1 doz 10%
Towers'. 25%
Davis's Improved Handcuffs & Hands. Polished. 1 doz, \$4.00. Nickel. \$57.00; 3 hands, Polished, 1 doz. \$72.00; Nickel. \$84.00. 25%
J. P. Lovell's Police Goods. 25%

Polish—

Metal—
Prestoline. 30%
Prestoline Paste. 33&10%
Gaston's Silver Compound. 33&10%

Stove—

Joseph Dixon's. 1 doz, \$6.00, 10%
Gem. 1 doz, \$4.50, 10%
Gold Medal. 1 doz, \$6.00, 25%
Lustro. 1 doz, \$4.75
Ruby. 1 doz, \$7.75
Rising Sun, 6 gro lots. 1 doz, \$5.50
Dixon's Plumbago. 1 doz, \$8.00
Boynton's Noon Day. 1 doz, \$13.00
Parlor Pride Stove Enamel. 1 doz, \$13.00
Yates' Liquid. 2 3 6 10 gal
1 gal. \$3.00
Yates Standard Paste Polish, 10 lb cans. 12&10%
Jet Black. 1 doz \$3.50
Japanese. 1 doz \$3.50
Presline. 1 doz \$2.50
Diamond O. K. Enamel. 1 doz \$19.00
Bonnell's Liquid Stove Enamel. 1 doz \$2.00
Bonnell's Paste Stove Polish. 1 doz \$6.00
Black Eagle Benzine Paste, 5 and 10 lb cans. 12&10%
Black Jack Water Paste, 5 and 10 lb cans. 12&10%
Nickel Plate Paste. 1 doz \$6.00
Crown Paste. 1 doz \$7.20
Crown Paste in 5 and 10 lb pails. 1 doz \$12.00
Black Flag. 1 doz \$7.20
Black Flag, 5 and 10 lb pails. 1 doz \$12.00
Black

Pullers Nail—

Scranton. # doz. \$18.00, 38¢
 Giant, No. 1. # doz. \$18.00, 10¢
 Giant, No. 2. # doz. \$15.00, 10¢
 Pelican. # doz. \$9.00, 25¢
 Eclipse. # doz. \$24.00, 40¢
 Economy. # doz. \$6.00

Pulleys—

Hot House, Awning, &c. 60¢@70¢
 Japanned Screw. 60¢@10¢
 Brass Screw. 60¢@10¢
 Japanned Side. 60¢@10¢
 Moore's Side, Anti-Friction. 50¢
 Moore's Ceiling or End, Anti-Friction. 50¢
 Moore's Dumb Waiter, Anti-Friction. 50¢
 Moore's Electric Light. 35¢
 Japanned Clutch. 60¢@10¢
 Hay Fork, Solid Eye, 4.00. 50¢
 Hay Fork, "Anti-Friction," 5 in. solid. 50¢
 Hay Fork, "F" Common and Patent. 50¢
 Bushed. 20¢
 Hay Fork, Tarred. 20¢
 Hay Fork, Read's Self-Lubricating. 60¢
 Hay Fork, Moore's Anti-Friction 5 in. 50¢
 Wheel. # doz. \$12.00. 40¢
 Shade Rack. 40¢
 Tackle Blocks—See Blocks.
 Shepard's Niagara, No. 25. # doz 23¢ net
 Sash (Auger Morse). 60¢
 Common Sense. 60¢
 Empire. 60¢
 Ideal, Nos. 2, 4, 10 & 15. # doz less 1¢
 Acme. 60¢
 Star. 60¢
 On bbl. lots extra 5¢.
 Ideal, Nos. 25 and 55. # doz. 22¢ net.

Pumps—

Cistern, Best Makers. 60¢@60¢10¢
 Pitcher Spout, Best Makers. 67¢@70¢
 Pitcher Spout, Cheaper G'ds. 75¢@75¢10¢

Punches—

Saddler's or Drive, good. # doz. 60¢@65¢
 Bemis & Call Co.'s Cast Steel Drive. 50¢@55¢
 Bemis & Call Co.'s Springfield Socket. 50¢
 Spring, good quality. # doz. \$2.50@2.80
 Spring, Leach's Pat. 15¢
 Bemis & Call Co.'s Spring. 50¢@55¢
 Bemis & Call Co.'s Check. 55¢
 Solid Tinner's, P., S. & W. Co., # doz. \$1.44
 Tinner's Hollow Punches, P., S. & W. Co. 55¢
 Co. 20¢@22¢
 Rice Hand Punches. 15¢
 Avery's Revolving. 15¢
 Avery's Sawset and Punch—See Sawsets
 Niagara Hollow Punches. 20¢@22¢
 Niagara Solid Punches. 55¢

Rail—

Sliding Door, Wrt's Brass. # d. 35¢, 40¢
 Sliding Door, Bronzed Wrt's Iron. # ft. 7¢
 Sliding Door, Iron, Painted. # ft. 4¢, 40¢
 Barn Door, Light. In. # 2 2.50 3.10, 10¢
 Per 100 feet. \$2.00 2.50 3.10, 10¢
 B. D. for N. E. Hangers.

Rakes—

Cast Steel, Association G'ds. 70¢@70¢5¢
 Cast Steel, outside g'ds. 70¢@70¢5¢
 Malleable. 70¢@70¢5¢
 Gibbs' Lawn Rake. # doz. \$4.00
 Gibbs' Canton Lawn Rake. # doz. \$3.75
 Gibbs' Acme Lawn Rake. # doz. \$4.75
 Gibbs' Favorite Lawn Rake. # doz. \$5.00
 Gibbs' Crown Lawn Rake, No. 1. # doz. \$4.90; No. 2, \$5.40
 Oneida Lawn Rake. # doz. \$6.00
 Fort Madison Prize Bow Brace and
 Peerless. 65¢
 Fort Madison Steel Tooth Lawn Rake. \$6.00. 25¢

Razors—

J. R. Torrey Razor Co. 20¢
 Wostenholm and Butcher, \$10 to 2.
 Jordan's AAA, new list. Net
 Jordan's Old Faithful, new list. Net
 Galvanic. # doz. \$15.00
 Electric Cutlery Co. 50¢
 Campbell Cutlery Co. 50¢

Razor Straps—

See Straps, Razor.
Registers—
 Moore's Japanned. 75¢
 Moore's Electroplated. 70¢
 Moore's Bronze Finishes. 70¢
 Moore's Solid Bronze. 80¢
 Moore's Stove Pipe. 33¢

Rings and Ringers—

Bull Rings—
 Union Nut Co. 55¢
 Sargent's. 75¢@10¢
 Hotchkiss' low list. 30¢
 Humason, Beckley & Co.'s. 70¢@10¢
 Peck, Stow & W. Co.'s. 50¢@10¢50¢10¢10¢
 Ehrlich Hdw. Co., White Metal, low list. 50¢@50¢10¢

Hog—

Top of the Hill Ringers. # doz \$2.00
 Top of the Hill Ringers. # doz \$1.25
 Hill's Improved Ringers. # doz \$1.25
 Hill's Old Style Ringers. # doz \$1.12 1/2
 Hill's Tongs. # doz bxs \$3.00
 Hill's Rings. # doz bxs \$1.00
 Perfect Rings. # doz bxs \$1.50
 Perfect Rings. # doz \$2.15@2.25
 Blair's Hog Rings. # doz \$2.00
 Blair's Hog Rings. # doz \$2.00
 Champion Ringers. # doz \$2.00
 Champion Ringers, Double. # doz \$2.25
 Brown's Ringers. # doz \$2.00
 Brown's Ringers. # doz \$1.15@1.25
 Electric Hog Rings. # doz boxes \$1.50
 Electric Hog Rings. # doz \$2.00
 Major Rings. # doz \$1.25
 Major Ringers. # doz \$2.00

Rivets and Burrs—

Norway Iron, list Nov. 17, '87. 60¢@10¢
 Second quality. 70¢
 Copper. 60¢@10¢
 Coppered Iron, Bethia Brand. 50¢@5¢

Rivet Sets—See Sets.**Roasting and Baking Pans—See Pans, Roasting and Baking.****Rods—**

stair, Brass. 25¢@30¢
 stair, Black Walnut. # doz 40¢

Rollers—

Barn Door, Sargent's list. 60¢@10¢10¢
 Aime Moore's Anti-Friction. 55¢
 Union Barn Door Roller. 70¢
 Moore's Barn Door Stay. 60¢
 Thompson Mfg. Co.'s Lawn Rollers. 30¢

Rope—

The following prices are f.o.b. New York or factory, and are shaded 1/4¢@1/2¢ on large lots; terms, 1 1/2% for cash.
 Manila, 7-16 in. diam. and larger. # d. 8 1/2¢
 Manila, 1/4 and 5-16 in. # d. 9 1/2¢
 Manila, Tarred Rope. # d. 8 1/2¢
 Manila, Hay Rope, Medium. # d. 8 1/2¢
 Sisal, 7-16 inch and larger. # d. 7 1/2¢
 Sisal, 1/4 and 5-16 in. # d. 7 1/2¢
 Sisal, Hay Rope. # d. 6 1/2¢
 Sisal, Tarred Rope. # d. 6 1/2¢
 Sisal, Medium Lath Yarn. # d. 6 1/2¢
 New Zealand, 7-16 in. & larger. # d. 6 1/2¢
 New Zealand, 1/4 and 5-16 inch. # d. 7 1/2¢
 New Zealand, Hay Rope. # d. 6 1/2¢
 New Zealand, Tarred Rope. # d. 6 1/2¢
 Cotton Rope. # d. 13 1/4¢@16 1/4¢
 Jute Rope. # d. 6 1/2¢@7 1/2¢

Wire—

List February, 1892. All kinds. 45¢

Rules—

Boxwood. 80¢@10¢10¢80¢10¢10¢10¢
 Ivory. 50¢@10¢
 Starrett's Steel Rules and Straight Edges. 25¢@10¢

Sad Irons—See Irons, Sad.**Sand and Emery Paper and Cloth—****Sash Cord—See Cord, Sash.****Sash Locks—See Locks, Sash.****Sash Weights—****See Weights, Sash.****Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.****Saws—**

Disston's Circular. 45¢@45¢5¢
 Disston's Cross Cut, list Jan. 1, '93. 40¢@10¢
 Disston's Hand. 25¢
 Woodrugh & McFarlin. 25¢@10¢
 Hand, Panel and Rip. 45¢@10¢
 Cross Cuts, list Jan. 1, 1893. 45¢@10¢
 Wheeler, Madden & Clemson Mfg. Co. 30¢@10¢
 Hand, Panel and Rip. 45¢@10¢
 Cross Cuts, list Jan. 1, 1893. 45¢@10¢
 Atkins' Circular. 50¢@10¢
 Atkins' Cross Cuts, new list. 40¢
 Atkins' Mower Mill and Drag. 50¢@10¢
 Atkins' One-Man Saw. 40¢
 Atkins' Wood Saws. 40¢
 Peace Circular and Mill. 45¢@45¢5¢
 Peace Hand Panel and Rip. 25¢@25¢5¢
 Peace Cross Cuts, list Jan. 1, '93. 45¢@10¢
 Richardson's Circular and Mill. 45¢@45¢5¢
 Richardson's Cross Cuts, list Jan. 1, '93. 45¢@10¢
 Richardson's Hand &c. 25¢@25¢5¢
 C. E. Jennings & Co.'s. 25¢

Hack Saws—

Griffin's, complete. 40¢@10¢60¢
 Griffin's Hack Saw Blades. 40¢@10¢60¢
 Star Hack Saws and Blades. 25¢
 Eureka and Crescent. 25¢

Scroll—

Lester, complete, \$10.00. 25¢
 Rogers, complete, \$3.00. 25¢
 Barnes' Builders' and Cab Makers' \$15.25. 25¢
 Barnes' Scroll Saw Blades. 35¢

Saw Frames—**See Frames, Saw.****Saw Sets—See Sets, Saw.****Saw Tools—See Tools, Saw.****Scales—**

Hatch, Counter, No. 171, good quality. # doz \$18.00@19.00
 Hatch, Tea, No. 161. # doz \$5.00@7.00
 Union Platform, Plain. # doz \$2.10@2.20
 Union Platform, Striped. # doz \$2.40@2.50
 Chatillon's Grocers' Trip Scales. 50¢
 Chatillon's Eureka. 25¢
 Chatillon's Favorite. 40¢
 Family Turnbells. 30¢@30¢10¢
 Reliable Bros.' Platform. 40¢

Scale Beams—**See Beams, Scale.****Scissors, Fluting—****Scrapers—**

Adjustable Box Scraper (S. R. & L. Co.) 30¢@10¢
 Box 1 Handle. # doz \$2.00
 Box 2 Handle. # doz \$3.00@3.10
 Defiance Box and Ship. 20¢@10¢
 Foot. 50¢@10¢60¢
 Ship, Common. # doz \$3.50
 Ship, R. I. Tool Co. # doz \$3.50

Screen Window and Door**Frames—See Frames****Screw Drivers—****See Drivers, Screw.****Screws—****Bench and Hand—**

Bench, Iron. 55¢@10¢55¢10¢10¢
 Bench, Wood, Beech. # doz \$2.25
 Bench, Wood, Hickory. 20¢@10¢
 Hand, Wood. 25¢@10¢25¢10¢5¢
 Hand, Grand Rapids, list. 35¢

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890. 80¢@80¢10¢
 Coach and Lag, Gimlet Point, list Jan. 1, 1890. 80¢@80¢5¢
 Hand Rail, Sargent's. 70¢@10¢
 Hand Rail, H. & B. Mfg. Co. 70¢@10¢75¢
 Hand Rail, Am. Screw. 75¢

Jack Screws—

Jack Screws, Millers Falls list. 50¢@50¢10¢
 Jack Screws, P., S. & W. 35¢
 Jack Screws, Sargent. 40¢@40¢10¢
 Jack Screws, Stearns. 40¢@40¢10¢

Cork—

Humason & Beckley Mfg. Co. 40¢@10¢50¢
 Williamson's. 35¢@35¢5¢
 Williamson's Forged Worm, Applewood Handle, # doz. \$5.00; Rosewood. 40¢
 Detroit Cork Screw Co. 35¢@5¢

Machine—

Flat Head Iron. 65¢
 Round Head Iron. 60¢

Wood—

List January 1, 1891.
 Flat Head Iron. 70¢
 Round Head Iron. 65¢
 Round Head Brass. 70¢
 Round Head Brass. 70¢
 Round Head, Bronze. 70¢
 Round Head, Bronze. 65¢
 Rogers Drive Screws. 82¢@5¢

Scroll Saws—See Saws, Scroll.**Scythes—**

Grain. 40¢@5¢40¢10¢
 Grass. 40¢@10¢50¢

Scythe Snaths—**See Snaths, Scythe.****Sets—**

Alken's Sets, Awls and Tools.
 No. 20, # doz \$10.00. 60¢@60¢5¢
 Fray's Adj. Tool Hdl's, No. 1, \$12; 2, \$18; 3, \$12; 4, \$9. 45¢
 Millers Falls Adj. Tool Hdl's.
 No. 1, \$12; 2, \$18. 25¢
 Henry's Combination Haft. # doz \$6.50
 Stanley's Excelsior.
 No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50. 30¢@10¢
 Common Brad Sets.
 No. 42, \$10.50; No. 43, \$12.50. 70¢@10¢5¢

Nail—

Square. # gr. \$4.00@4.25
 Round. # gr. \$3.25
 Buck Bros. 27¢@5¢
 Cannon's Diamond Point. # gr. \$12.20

Rivet—

Regular list. 70¢

Saw—

Stillman's Genuine. # doz \$5.00@7.75. 40¢@5¢
 Stillman's Pattern, Hand, # doz \$3.25. 40¢@5¢
 Cross Cut, \$6.50. 55¢@55¢10¢
 Common Lever. # doz \$2.00, 45¢@50¢
 Hart's Pat. Lever. \$1.50. 40¢@20¢
 No. 11, \$16.00. 40¢@20¢
 Nos. 3 and 4, Cross Cut, \$23.00. 40¢@20¢
 No. 5, Mill, \$31.00. 40¢@20¢
 No. 10, \$15.50. 40¢@20¢
 Leach's. No. 0, \$8.00; No. 1, \$15. 15¢@20¢
 Nash's. 20¢@10¢20¢10¢10¢
 Hammer, Hotchkiss. \$5.50, 10¢
 Hammer, Bemis & Call Co.'s new Pat. 45¢
 Bemis & Call Spring Hammer. 30¢@5¢
 Bemis & Call Co.'s Plate. 20¢
 Bemis & Call Co.'s Cross Cut. 30¢@5¢
 Alken's Genuine. \$13.00, 80¢@80¢10¢
 Alken's Imitation. # doz \$3.00@3.25. 25¢
 Hart's Pat. Lever. 25¢
 Disston's Star. 25¢
 Leopold. 40¢@10¢50¢
 Atkin's Lever. # doz No. 1, \$6.00
 Atkin's Criterion. # doz No. 1, \$6.00
 Croissant (Keller), No. 1, \$15.00. No. 2, \$24.00. 40¢@10¢50¢
 First quality. 40¢@10¢50¢
 Kohler's Royal. # doz \$7.00
 Kohler's Giant Royal. # doz \$12.00
 Crescent. # doz \$3.00
 Lloyd's Acme. # doz \$15, 40¢@10¢
 Taintor Positive. # doz \$18, 50¢

Sharpeners, Knife—

Applewood Handles. # uoz. \$6.00, 40¢
 Rosewood or Cocobola. # doz. \$9.00, 40¢

Shaves, Spoke—

Iron. 45¢
 Wood. 30¢
 Bailey's (Stanley R. & L. Co.). 40¢@10¢
 Stearns'. 30¢@10¢
 Cincinnati. 25¢@10¢
 Goodell's # doz. \$9.00. 25¢

Shears—

American (Cast) Iron. 75¢@10¢75¢10¢5¢
 Barnard's Lam. Trimmers. # doz. \$5.75
 Seymour's, list Dec. 1881. 60¢@10¢10¢60¢10¢10¢5¢
 Heinisch's, list Dec. 1881. 60¢@10¢10¢60¢10¢10¢5¢
 Heinisch's Tailor's Shears. 35¢@5¢
 Cast Steel Trimmers:
 First quality. 80¢@80¢10¢
 Second quality. 80¢@10¢80¢10¢10¢
 Acme Cast Shears. 10¢@10¢
 Diamond Cast Shears. 10¢
 Clipper. 10¢@10¢
 Victor Cast Shears. 75¢@10¢75¢10¢5¢
 Howe Bros. & Hulbert, Solid Forged Steel quality. 40¢
 Bates Cutlery Co. Solid Steel Forged. 60¢
 Davenport Cutlery Co. 60¢@80¢10¢
 Claus brand, Japanned. 70¢
 Claus brand, Nickel, same list. 60¢
 Galvanic 3/4 to 9 in., # doz. \$1.00 # inch Electric Cutlery Co. Net
 Campbell Cutlery Co., Jap'd. 65¢
 Nickel plated. 65¢

Tinner's Snips—

Wrt. Handles, Steel Blades. 20¢@20¢10¢
 Wrt. Snips and Shears. 20¢@10¢
 Cast Handles, Laid with Steel. 40¢

Pruning Shears and Hook

Disston's Combined Pruning Hook and Saw. # doz. \$18.00, 20¢@10¢
 Disston's Pruning Hook. # doz. \$12.00, 20¢@10¢
 E. S. Lee & Co.'s Pruning Tools. 50¢@10¢70¢
 Pruning Shears, Henry's Pat. # doz. \$3.75@4.00
 Henry's Pruning Shears, # doz. \$1.25
 Wheeler, M. & C. Co., Combination. # doz \$12.00
 Dunlap's Saw and Chisel, # doz \$8.50, 30¢
 J. Mallinson & Co., No. 1, \$5.25; No. 2, \$7.25. 60¢
 P., S. & W. Co. 60¢@10¢2¢
 Levin Pruner No. 1, \$15.00 # doz. 40¢@3¢
 Levin Pruner No. 2, \$21.00 # doz. 40¢@3¢

Tinner's, &c.—

Shears and Snips (P. S. & W.). 20¢@25¢
 Snips, J. Mallinson & Co. 33¢@5¢

Sheaves—**Sliding Door—**

M. W. Co., list July, 1888. 50¢@10¢60¢5¢
 R. & E., list Dec. 18, 1885. 55¢@20¢
 Corbin's list. 60¢@10¢2¢
 Patent Roller. 60¢@10¢2¢
 Patent Roller, Hatfield's. 75¢
 Russell's Anti-Friction, list Dec. 18, 1885. 60¢@5¢
 Moore's Anti-Friction. 50¢

Sliding Shutter—

R. & E., list Dec. 18, 1885. 60¢@10¢2¢
 Sargent's list. 70¢
 Reading list. 60¢@10¢10¢

Shells—

First quality 4, 8, 10 and 12 gauge. 25¢@10¢2¢
 First quality Rival, Club and Climax brands, 14, 16 and 20 gauge. (\$7.50 list). 20¢@10¢2¢
 Prize. 40¢@2¢
 Star, Club, Rival and Climax Brands. 33¢@10¢2¢
 Smokeless brand, 12, 10, 16 gauge. 33¢@10¢2¢
 Trap brand, 12 and 10 gauge. 33¢@10¢2¢
 Selbold's Comb. Shot Shells. 15¢@2¢
 Brass Shot Shells, 1st quality. 60¢@2¢
 Brass Shot Shells, Club, Rival, Climax. 65¢@2¢

Shells, Loaded—

Standard List, July 19, 1890. 40¢@10¢10¢40¢10¢10¢5¢
 7¢ cash, 10 days.

Ship Tools—

L. & I. J. White. 20¢@5¢

Shoes, Horse, Mule, &c.

Burden's, Perkins', Phoenix, Standard, Diamond State, Bryden's Boss and Crescent, at factory. \$4.00
 Bryden's Frog Pressure, at factory. \$5.00

Mule—

Snaps, Harness, &c.

Anchor (T. & S. Mfg. Co.)	50¢
Fitch's (Bristol)	50¢
Hotchkiss	10¢
Andrews	50¢
Sargent's Patent Guarded	70¢
German, new list	40¢
Covert, New Patent	50¢
Covert, New R. E.	60¢
Covered Spring	60¢
Covert's Saddlery Works' Triumph	33¢
John Protz Snaps	75¢
Kelley & Woolworth's Steel Harness	50¢

Snaths

Scythe	50¢
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Soldering Irons

See Irons, Soldering.

Spittoons, Cuspidors, &c.**Standard Fiberware**

Cuspidors, 8 1/2-inch, # doz., No. 5, \$8; No. 5X, \$9.

Spittoons, Dials, 8-inch, No. 1, 1; 10 and 11 inch, \$8.

Spoke Shaves

See Shaves, Spoke

Spoke Trimmers

See Trimmers, Spoke.

Spoons and Forks**Tinned Iron**

Basting, Cen. Stamp, Co.'s list, 70¢

Solid table and Tea, Cen. Stamp, 70¢

Buffalo, S. S. & Co., 33¢

Silver Plated

4 months or 5¢ cash 30 days:

Meriden Brit. Co., Rogers, 40¢

Rogers & Hamilton, 40¢

C. Rogers & Bros, 40¢

Rogers & Bros, 40¢

Reed & Barton, 40¢

Wm. Rogers Mfg. Co., 40¢

Simpson, Hall, Miller & Co., 40¢

Holmes & Edwards Silver Co., 40¢

L. Boardman & Son, 50¢

Miscellaneous

Holmes & Edwards Silver Co., 50¢

No. 30 Silver Metal, 50¢

No. 24 German Silver, 50¢

No. 50 Nickel Silver, 50¢

No. 40 Nickel Silver, 50¢

Wm. Rogers Mfg. Co., 50¢

Rogers' Silver Metal, 50¢

18¢ Rogers' German Silver, 60¢

22¢ Rogers' Nickel Silver, 50¢

Rogers & Hamilton, 40¢

Steel Goods, 40¢

Cimeter, Flatware, 40¢

Cimeter, Steel Goods, 40¢

Crown Hamilton, Flatware and Cutlery, 30¢

German Silver, 50¢

Nickel Silver, 50¢

Britannia, 60¢

Boardman's Nickel Silver, list July 1, 1891, 60¢

Boardman's Britannia Spoons, case lots, 60¢

Springs**Door**

Torrey's Rod, \$9 in, # doz \$1.20

Warner's No. 1, # doz \$1.50

Gem (Coil), list April 19, 1886, 20¢

Star (Coil), list April 19, 1886, 20¢

Victor (Coil), 60¢

Champion (Coil), 60¢

Cowell's, No. 1, # doz \$1.80

Rubber, complete, # doz \$4.50

Hercules, 50¢

Phoenix, 33¢

Carriage, Wagon, &c.

Elliptic, Concord, Platform and Half Scroll, 60¢

Chiff's Bolster Springs, 25¢

Squares

Steel and Iron, 80¢

Nickel Silver, 60¢

Try Square and T Bevels, 60¢

Disston's Try Square and T Bevels, 50¢

Winterbottom's Try and Miter, 30¢

Starrett's Micrometer Caliper Squares, 25¢

Avery's Flush Bevel Squares, 40¢

Avery's Bevel Protractor, 50¢

Squeezers**Fodder**

Blair's "Climate", # doz \$2.00

Blair's "Climate", # doz \$1.25

Lenon

Porcelain Lined, No. 1, # doz \$3.00

Wood, No. 2, # doz \$3.00

Wood, Common, # doz \$1.75

Dunlap's Improved, # doz \$3.75

Sammis No. 1, \$5.00; No. 2, \$9.12

\$18 # doz, # doz \$2.50

Jennings' Star, # doz \$2.50

The Boss, # doz \$2.50

Dean's, No. 1, # doz \$3.50; 2, \$3.35; 3, \$1.90; Queen, \$2.50

Little Giant, 50¢

King, 40¢

Hotchkiss Street Flash, # doz \$12.00

Silver & Co. Glass, # gro \$9.00

Standard Fiber Ware

See Ware, Standard Fiber.

Staples

Barbed Blind, 1/2 in. and larger, # 7/4

Barbed Blind, 1/2 in., # 8/4

Fence Staples, Galvanized, # as B'rd Wire

Fence Staples, Plain, # as B'rd Wire

Grand Crossing Tack Co.'s list, 75¢

Steel Yards

Steele and Dies

Blacksmiths

Waterford Goods, 35¢

Butterfield's, 35¢

Lighting, New Screw Plates, 25¢

Reece's New Screw Plates, 25¢

Reversible Ratchet, 80¢

Gardner, 25¢

Green River, 25¢

Staples, Bench

Morrill's, # doz, No. 1, \$10.00; No. 2, \$11.00

Hotchkiss', # doz, \$5, 10¢

Weston's, No. 1, \$10.00; No. 2, \$10.50

McGill's, # doz \$3.

Cincinnati, 25¢

Terrell's Nos. 1 and 2, # doz, \$3; No. 3, \$5.00

Millers Falls, 25¢

Stearns', 20¢

Stone**Grind-See Grindstones.****Scythe Stones**

Pike Mfg. Co., list April, 1892, 33¢

Cleveland Stone Co., list Nov. 1892, 33¢

Oil Stones, &c.

Pike Mfg. Co.

Hindustan No. 1, # doz \$8

Sand Stone, 40¢

Turkey Oil Stone, 4 to 8 in., 10¢

Turkey Slips, 20¢

Lily White Washita, 60¢

Rosy Red Washita, 60¢

Washita Stone, Extra, 50¢

Washita Stone, No. 1, 40¢

Washita Stone, No. 2, 30¢

Lily White Slips, 60¢

Rosy Red Slips, 60¢

Washita Slips, Extra, 70¢

Washita Slips, No. 1, 80¢

Arkansas Stone, No. 1, 3 to 5 1/2 in., \$2.30

Arkansas Stone, No. 1 1/2 to 8 in., \$3.50

Lake Superior, 13¢

Lake Superior Slips, 20¢

Stove Polish

See Polish, Stove.

Stretchers Carpet

Cast Steel, Polished, # doz \$2.2

Cast Iron, Steel Points, # doz \$7.80

Socket, # doz \$1.75

Bullard's, 25¢

Strops, Razor

Genuine Emerson, 60¢

Imitation, # doz \$2.00

Torrey's, 20¢

Badger's Belt and Com., # doz \$2.00

Lamont Combination, # doz \$4.00

Jordan's Pat. Padded, list Nov. 1, '89, 50¢

Electric Cutlery Co., Net

Campbell Cutlery Co., Net

Stuffer, Sausage

Miles' Challenge, # doz \$20

Perry, # doz, No. 1, \$15.00; No. 0, \$21.00

Duperette, # doz \$30.00

Enterprise Mfg. Co., list Jan 17, '93, 25¢

Silver's, 40¢

Sweepers, Carpet and Lawn**Carpet**

Bissell No. 5, # doz \$17.00

Bissell No. 8, # doz \$20.00

Bissell, Grand, # doz \$36.00

Standard, # doz \$24.00

Draw Cut No. 4, each \$30.00

Domestic, No. 2, # doz \$21.00

Grand Rapids, # doz \$24.00

Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00

Magic, # doz \$15.00

Improved Parlor Queen, # doz \$27.00

Japanned, # doz \$24.00

Excelsior, # doz \$22.00

Garland, # doz \$18.00

Parlor Queen, # doz \$24.00

Housewife's Delight, # doz \$15.00

Ladies' Friend, # doz \$15.00

Ladies' Friend No. 2, # doz \$15.00

Advance, # doz \$18.00

Our Leader, # doz \$19.00

Triumph, # doz \$20.00

Supreme, # doz \$22.00

Easy, Jap'd, # doz \$22.00; Nickel, \$24.00

Gilt Edge, # doz \$24.00

Acme, # doz \$26.00

Imperial, # doz \$26.00

Grand Republic, # doz \$26.00

Jap'd, # doz \$30.00; Nickel, \$33.00

Banner, # doz \$21.00

The Star, # doz \$22.00

Reliable, # doz \$22.00

Jap'd, # doz \$22.00; Nickel, \$24.00

Our Own, # doz \$27.00

Model, # doz \$27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:

5 dozen in 6 months, # doz \$1.00

10 dozen in 6 months, # doz \$1.00

Exception on L.P., when 10 dozen price is \$13.50, and 25 dozen \$13.00.

Lawn

Thompson Mfg. Co., 30¢

Swings

Davies Lawn, 25¢

Tacks, Brads &c.

List October 19, 1893. Old established straight weights. Short weight goods are sold at lower prices.

Carpet Tacks

American, Blued, 60¢

American, Tinned and Cop'd, 70¢

Steel, Bright and Blued, 60¢

Steel, Tinned and Cop'd, 70¢

Swedes Iron, Blued, 72¢

Swedes Iron, Tinned, 75¢

American Iron Tacks, Domestic, 60¢

Swedes Iron Tacks

S. S., Blued, 60¢

S. S., Tinned, 70¢

Lanc, Blued, 55¢

Lanc, Tinned, 60¢

Gimp and Lace Tacks

S. S., Blued, 62¢

S. S., Tinned, 63¢

Lanc, Blued, 55¢

Lanc, Tinned, 60¢

Basket and Trimmer Tacks

Lanc, 52¢

S. S., 55¢

Hungarian Nails, 60¢

Common and Patent Brads, 50¢

Leathered Tacks, 10¢

Brick Tacks, S. S., 35¢

Looking Glass Tacks, S. S., 35¢

Picture Frame Points, S. S., 35¢

Finishing Nails, 60¢

Trunk and Clout Nails

Black, 65¢

Tinned or Coppered, 67¢

Backed, 65¢

Chair Nails, 50¢

Cigar Box Nails, 45¢

Tin Capped Nails, 50¢

Miscellaneous

Double Point, 90¢

Wire Carpet Nails, 50¢

Claw Handle Carpet, 50¢

Bonnie Blue, # box \$4.00

Bill Nye Brad Box.

Parisian Gift Nails, cartoon, 50¢

Home Tacks, No. 50 # case (12 cartons), \$36.00; No. 100, # case (12 cartons), \$72.00

Home Nails, No. 200, # case (12 cartons), \$60.00; No. 400, # case (12 cartons), \$60.00

Upholsterers' Nails, 50¢

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list, 50¢

See also Nails, Wire.**Tanks, Oil**

Emerald, S. S. & Co.: 30-gal. \$8.75; 60-gal., \$11 each, 50¢

Tapes, Measuring

American, 40¢

Spring, 25¢

Chesterman's, Regular list, 25¢

Thermometers

Tin Case, 30¢

Thimble Skelns-See Skelns.**Ties, Bale-Steel.**

Standard Wire, list, 50¢

Tinners' Shears, &c.

See Shears, Tinners' &c.

Tinware

Stamped, Japanned and Plated, list Jan 20, 1887, 70¢

Tire Benders, Upsetters, &c.-See Benders and Upsetters.**Tire.****Tobacco Cutters**

See Cutters, Tobacco.

Tools**Coopers'**

Bradley's, 20¢

Barton's, 20¢

L. & J. White, 20¢

Albertson Mfg. Co., 25¢

Beatty's, 30¢

Sandusky Tool Co., 30¢

Whips

American Whip Co.: Length.	4 1/2	5	5 1/2	6	6 1/2	7	7 1/2	8 ft.
X. L. Whalebone Driving.....	\$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.....	15.00	16.50	18.00	20.00				
Bull Bone, Half-length Whalebone.....			11.00	12.00	13.00	15.00		
American Standard.....	8.00	8.50	9.00	10.00	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center.....	6.00	6.00	6.50	7.00	7.50	8.00		
New Name, Stocked Java, Black and Wine Colors.....				6.00				
American, 93 Pen Whip.....				6.00				
Gents' Light Driving No. 111.....				6.00				
Gents' Light Driving No. 106.....				5.00				
Hand-made Stocked Java No. 108.....			3.75	4.00				
Large variety of cheaper grades.....								
Team Whips.....								
Toy Whips.....								
Hardware Assortment, 10 American, 75 Whips for \$50.00.....								

Per dozen.

Ossawan Mills, Brass and Copper on Spools..... 50&10%
 Tate's Spooled, Tin'd & Annealed..... 60&25%
 Tate's Spooled Cop. and Brass..... 50%
 Cast Steel Wire..... 50%
 Stub's Steel Wire..... \$3.00 to \$2.30%
 Steel Music Wire, 12 to 30, imported..... 60&70%
 Wire Clothes Line, see Lines.
 Wire Picture Cord, see Cord.

Bright Wire Goods—
 Standard list..... 35&10&35&10&10%
Wire Cloth and Netting—
 Painted Screen Cloth #100 ft..... \$1.75
 Galvanized Wire Netting..... 76&10&75&10&5%

Wire Barb—
 See Trade Report.
Wire Rope—See Rope, Wire.
Wrenches—

American Adjustable..... 40%
 Baxter's Adjustable "S"..... 40&10&50%
 Baxter's Diagonal..... 60%
 Coes' Genuine..... 50&50&10%
 Coes' "Mechanics"..... 50&10&2%
 Girard Standard..... 55&10&70%
 Lamson & Sessions' Engineers'..... 60&10%
 P. S. & W. Agricultural..... 70&10%
 Girard Agricultural..... 75&10&80%
 Lamson & Sessions' Agric'l.....
 W. & B. Diamond.....

Bemis & Call's:
 Pat. Combination Bright..... 40&5%
 Pat. Combination Black..... 40&10%
 Merrick's Pattern..... 45%
 Briggs' Pattern..... 30&10%
 Cylinder or Gas Pipe..... 45&5%
 No. 3 Pipe..... 55%
 Aiken's Pocket (Bright)..... \$6.00, 50&10%
 The Favorite Pocket..... \$ doz., \$1.00, 40%
 Webster's Pat. Combination..... 25%
 Boardman's..... 30%
 Always Ready..... 25&5%
 Alligator..... 20&10%
 Donohue's Engineer..... 50%
 Eagle..... 50&10%
 Acme, Bright..... 50&2%
 Acme, Nickle..... 40&2%
 Hercules..... 70&70&5%
 Walker's..... 35&3%
 Diamond Steel..... 35&3%
 Cincinnati Brace Wrenches..... 25&10%
 Taffs Vise Wrench..... 55&10&3%

Wringers, Clothes

Am. Wringer Co.'s list, July 1, '93..... 2% cash
 Colby Wringer Co., list Sept. 1, '91..... 2% cash
 Lovell Mfg. Co., list July 1, 1892..... 2% cash
 Peerless Mfg. Co., list Feb., 1892..... 2% cash
 National Wringer & Mfg. Co., list June 1, 1892..... 2% cash

Wrought Goods—

Staples, Hooks, &c., list, March 17, 1892..... 85&10&85&15%

Wire and Wire Goods—**Iron—**

Market,
 Br. & Ann., Nos. 0 to 13.....
 75&10&75&10&5%
 Cop'd, Nos. 0 to 13.....
 Galv., Nos. 0 to 13.....
 70&5&70&10%
 Tin'd, Tin'd Nos. 0 to 13.....
 70&70&10%

Stone,
 Br. and Ann'd,
 Nos. 16 to 18..... 80%
 Nos. 19 to 26..... 80&5%
 Nos. 27 to 36..... 82&5%
 Tinned Broom Wire, 18 to 21, B. & A..... 4%
 Galvanized Fence..... 75&10%
 Brass, list Jan. 18, 1894..... 40&5%
 Copper, list Jan. 18, 1894..... 40&5%
 Annealed Wire on Spools..... 60&5%
 Malin's Brass and Cop. on Spools..... 50&5%
 Ossawan Mills, Ann'd and Tinned on Spools..... 80&10%

Paints, Oils and Colors.—Wholesale Prices.

Animal and Vegetable Oils—

Linseed, City, raw, per gal.....	@ 40
Linseed, City, boiled.....	@ 43
Linseed, Western, raw.....	@ 38
Lard, City, Extra Winter.....	@ 77
Lard, City, Prime.....	@ 75
Lard, City, Extra No. 1.....	@ 50
Lard, City, No. 1.....	@ 45
Lard, Western, prime.....	@ 36
Cotton-seed, Crude, prime.....	@ 34
Cotton-seed, Crude, off grades.....	@ 32
Cotton-seed, Summer Yellow, prime.....	@ 40
Cotton-seed, Summer Yellow, off grades.....	@ 37
Sperm, Crude.....	@ 75
Sperm, Natural Spring.....	@ 80
Sperm, Bleached Spring.....	@ 82
Sperm, Natural Winter.....	@ 81
Sperm, Bleached Winter.....	@ 88
Whale, Crude.....	@ 48
Whale, Natural Winter.....	@ 41
Whale, Extra Bleached.....	@ 52
Sea Elephant, Bleached Winter.....	@ 35
Menhaden, Crude, Sound.....	@ 39
Menhaden, Crude, Southern.....	@ 40
Menhaden, Light Pressed.....	@ 43
Menhaden, Bleached Water.....	@ 60
Menhaden, Extra Bleached.....	@ 55
Tallow, City, prime.....	@ 54
Tallow, Western, prime.....	@ 54
Cocoonut, Ceylon.....	@ 64
Cocoonut, Cochiti.....	@ 40
Cod, Domestic.....	@ 42
Cod, Foreign.....	@ 44
Red Saponified.....	@ 38
Bank.....	@ 39
Straits.....	@ 58
Olive, Italian, bbls.....	@ 80
Neatsfoot, prime.....	@ 75
Palm, prime, Lagos.....	@ 74

Mineral Oils—

Black, 29 gravity, 25 to 30 cold test.....	@ 7
Black, 29 gravity, 15 cold test.....	@ 8
Black, 20 gravity, summer.....	@ 14
Cylinder light, filtered.....	@ 16

Cylinder, dark, filtered.....	@ 10
Paraffine, 23 1/2 gravity.....	@ 11
Paraffine, 25 gravity.....	@ 10
Paraffine, 28 gravity.....	@ 7 1/2
Paraffine, red.....	@ 1 1/2

Paints and Colors—

Barytes, Foreign, 1/2 ton.....	@ 22.00
Barytes, Amer. floated.....	@ 20.00
Barytes, Amer. No. 1.....	@ 16.00
Barytes, Amer. No. 2.....	@ 13.00
Barytes, Amer. No. 3.....	@ 11.00
Blue, Celestial.....	@ 6
Blue, Chinese.....	@ 40
Blue, Prussian.....	@ 25
Blue, Ultramarine.....	@ 25
Brown, Spanish.....	@ 3
Brown, Vandyke, Amer.....	@ 3 1/2
Brown, Vandyke, English.....	@ 8
Carmin, No. 40, in bulk.....	@ 2.75
Carmin, No. 40, in boxes or barrels.....	@ 2.85
Carmin, No. 40, in ounce bottles.....	@ 3.75
Chalk, in bulk.....	@ 1.75
Chalk, in bbls., #100 lb.....	@ 33
China Clay, English.....	@ 13.00
Cobalt Oxide, prep'd.....	@ 9.00
Cobalt Oxide, black.....	@ 1.90
Cobalt Oxide, black, less 100 lb.....	@ 1.96
Green, Paris, in bulk.....	@ 10
Green, Paris, 170 to 175 lb.....	@ 10 1/2
Green, Paris, small pack.....	@ 12
Green, Chrome, ordinary.....	@ 12
Green, Chrome, extra.....	@ 22
Lead, Eng., B.B. white.....	@ 8 1/2
Lead, Amn. White, dry or in oil.....	@ 7
Kegs, lots less than 500 lb.....	@ 7 1/2
Kegs, lots 500 lb to 5 tons.....	@ 6 1/2
Kegs, lots 5 tons to 12 tons.....	@ 6 1/2
Kegs, lots 12 tons and over.....	@ 6 1/2
Lead White, in oil, 25 lb tin pails, add to keg price.....	@ 1 1/2
Lead White, in oil, 12 1/2 lb tin pails, add to keg price.....	@ 1
Lead White, in oil, 1 to 5 lb assorted tins, add to keg price.....	@ 2 1/2
Lead, Red, bbls. and 1/2 bbls.....	@ 6 1/2
Lead, Red, kegs.....	@ 6 1/2
Litharge, kegs.....	@ 6 1/2
Litharge, bbls. and 1/2 bbls.....	@ 6 1/2

TERMS, &c.—Lead and Litharge.—On lots of 500 lb or over, 60 days' time or 2 1/2 % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	@ 1.35
Ocher, French Washed.....	@ 1 1/2
Ocher, German Washed.....	@ 1 1/2
Ocher, American.....	@ 1 1/2
Ocher, Mineral, English.....	@ 9
Orange Mineral, French.....	@ 10
Orange Mineral, German.....	@ 9 1/2
Orange Mineral, American.....	@ 8 1/2
Paris White, English Cliff-stone.....	@ 1.00
Paris White, American.....	@ 65
Red, Indian, English.....	@ 7
Red, Indian, American.....	@ 6 1/2
Red, Turkey.....	@ 9
Red, Tuscan.....	@ 9
Red, Venetian, American.....	@ 1.00
Red, Venetian, English.....	@ 1.20
Sienna, Italian, Burnt and Powd.....	@ 4
Sienna, Ital., Burnt Lumps.....	@ 1 1/2
Sienna, Ital., Raw, Powd.....	@ 4 1/2
Sienna, Ital., Raw, Lumps.....	@ 1 1/2
Sienna, American, Raw.....	@ 1 1/2
Sienna, American, Burnt and Powd.....	@ 1 1/2
Talc, French.....	@ 1 1/2
Talc, American.....	@ 1 1/2
Terra Alba, Frch., #100 lb.....	@ 95
Terra Alba, English.....	@ 70
Terra Alba, American No. 1.....	@ 65
Terra Alba, American No. 2.....	@ 45
Umber, Turkey, Burnt.....	@ 3 1/2
Umber, Turkey, Bnt. Ln.....	@ 2 1/2
Umber, Turkey, Raw and Powdered.....	@ 3 1/2
Umber, Turkey, R/w Lumps.....	@ 2 1/2
Umber, Turkey, Bnt. Amer.....	@ 1 1/2
Umber, Turkey, R/w Amer.....	@ 1 1/2
Yellow, Chrome.....	@ 10
Vermilion, American Lead.....	@ 11 1/2
Vermilion, Quicks' er, bulk.....	@ 57
Vermilion, Quicks' er, bags.....	@ 58
Vermilion, Quicksilver sm'r pkgs.....	@ 62
Vermilion, English Import.....	@ 85
Vermilion, Imitation, Eng.....	@ 8
Vermilion, Trieste.....	@ 90
Vermilion, Chinese.....	@ 92 1/2
Whiting Common, #100 lb.....	@ 37 1/2
Whiting Gliders.....	@ 45

Zinc, American, dry..... 4 @ 4 1/2
 Zinc, French, Red Seal..... 7 1/2 @
 Zinc, French, Green Seal..... 9 @
 Zinc, French, V. M. X..... 7 @
 Zinc, Antwerp, Red Seal..... 7 1/2 @
 Zinc, Antwerp, Green Seal..... 7 1/2 @
 Zinc, German, L. Z. O..... 6 1/2 @
 Zinc, V. M. in Poppy Oil, Seal, lots of 1 ton and over..... 10 1/2 @
 Zinc, V. M. in Poppy Oil, lots less than one ton..... 11 @
 Zinc, V. M. in Poppy Oil, Red Seal..... @
 Zinc, V. M. in Poppy Oil, lots of 1 ton and over..... 10 @
 Zinc, V. M. in Poppy Oil, lots less than 1 ton..... 10 1/2 @
 Zinc, V. M. in Poppy Oil, Discov'ts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or assorted grades, 1 1/2 to 25 bbls., 2 1/2 to 50 bbls., 4 1/2 to 100 bbls., 5 1/2 to 250 bbls., 6 1/2 to 500 bbls., 7 1/2 to 1000 bbls., 8 1/2 to 2000 bbls., 9 1/2 to 5000 bbls., 10 1/2 to 10000 bbls., 11 1/2 to 20000 bbls., 12 1/2 to 50000 bbls., 13 1/2 to 100000 bbls., 14 1/2 to 200000 bbls., 15 1/2 to 500000 bbls., 16 1/2 to 1000000 bbls., 17 1/2 to 2000000 bbls., 18 1/2 to 5000000 bbls., 19 1/2 to 10000000 bbls., 20 1/2 to 20000000 bbls., 21 1/2 to 50000000 bbls., 22 1/2 to 100000000 bbls., 23 1/2 to 200000000 bbls., 24 1/2 to 500000000 bbls., 25 1/2 to 1000000000 bbls., 26 1/2 to 2000000000 bbls., 27 1/2 to 5000000000 bbls., 28 1/2 to 10000000000 bbls., 29 1/2 to 20000000000 bbls., 30 1/2 to 50000000000 bbls., 31 1/2 to 100000000000 bbls., 32 1/2 to 200000000000 bbls., 33 1/2 to 500000000000 bbls., 34 1/2 to 1000000000000 bbls., 35 1/2 to 2000000000000 bbls., 36 1/2 to 5000000000000 bbls., 37 1/2 to 10000000000000 bbls., 38 1/2 to 20000000000000 bbls., 39 1/2 to 50000000000000 bbls., 40 1/2 to 100000000000000 bbls., 41 1/2 to 200000000000000 bbls., 42 1/2 to 500000000000000 bbls., 43 1/2 to 1000000000000000 bbls., 44 1/2 to 2000000000000000 bbls., 45 1/2 to 5000000000000000 bbls., 46 1/2 to 10000000000000000 bbls., 47 1/2 to 20000000000000000 bbls., 48 1/2 to 50000000000000000 bbls., 49 1/2 to 100000000000000000 bbls., 50 1/2 to 200000000000000000 bbls., 51 1/2 to 500000000000000000 bbls., 52 1/2 to 1000000000000000000 bbls., 53 1/2 to 2000000000000000000 bbls., 54 1/2 to 5000000000000000000 bbls., 55 1/2 to 10000000000000000000 bbls., 56 1/2 to 20000000000000000000 bbls., 57 1/2 to 50000000000000000000 bbls., 58 1/2 to 100000000000000000000 bbls., 59 1/2 to 200000000000000000000 bbls., 60 1/2 to 500000000000000000000 bbls., 61 1/2 to 1000000000000000000000 bbls., 62 1/2 to 2000000000000000000000 bbls., 63 1/2 to 5000000000000000000000 bbls., 64 1/2 to 10000000000000000000000 bbls., 65 1/2 to 20000000000000000000000 bbls., 66 1/2 to 50000000000000000000000 bbls., 67 1/2 to 100000000000000000000000 bbls., 68 1/2 to 200000000000000000000000 bbls., 69 1/2 to 500000000000000000000000 bbls., 70 1/2 to 1000000000000000000000000 bbls., 71 1/2 to 2000000000000000000000000 bbls., 72 1/2 to 5000000000000000000000000 bbls., 73 1/2 to 10000000000000000000000000 bbls., 74 1/2 to 20000000000000000000000000 bbls., 75 1/2 to 50000000000000000000000000 bbls., 76 1/2 to 100000000000000000000000000 bbls., 77 1/2 to 200000000000000000000000000 bbls., 78 1/2 to 500000000000000000000000000 bbls., 79 1/2 to 1000000000000000000000000000 bbls., 80 1/2 to 2000000000000000000000000000 bbls., 81 1/2 to 5000000000000000000000000000 bbls., 82 1/2 to 10000000000000000000000000000 bbls., 83 1/2 to 20000000000000000000000000000 bbls., 84 1/2 to 50000000000000000000000000000 bbls., 85 1/2 to 100000000000000000000000000000 bbls., 86 1/2 to 200000000000000000000000000000 bbls., 87 1/2 to 500000000000000000000000000000 bbls., 88 1/2 to 1000000000000000000000000000000 bbls., 89 1/2 to 2000000000000000000000000000000 bbls., 90 1/2 to 5000000000000000000000000000000 bbls., 91 1/2 to 10000000000000000000000000000000 bbls., 92 1/2 to 20000000000000000000000000000000 bbls., 93 1/2 to 50000000000000000000000000000000 bbls., 94 1/2 to 100000000000000000000000000000000 bbls., 95 1/2 to 200000000000000000000000000000000 bbls., 96 1/2 to 500000000000000000000000000000000 bbls., 97 1/2 to 1000000000000000000000000000000000 bbls., 98 1/2 to 2000000000000000000000000000000000 bbls., 99 1/2 to 5000000000000000000000000000000000 bbls., 100 1/2 to 10000000000000000000000000000000000 bbls., 101 1/2 to 20000000000000000000000000000000000 bbls., 102 1/2 to 50000000000000000000000000000000000 bbls., 103 1/2 to 100000000000000000000000000000000000 bbls., 104 1/2 to 200000000000000000000000000000000000 bbls., 105 1/2 to 500000000000000000000000000000000000 bbls., 106 1/2 to 1000000000000000000000000000000000000 bbls., 107 1/2 to 2000000000000000000000000000000000000 bbls., 108 1/2 to 5000000000000000000000000000000000000 bbls., 109 1/2 to 10000000000000000000000000000000000000 bbls., 110 1/2 to 20000000000000000000000000000000000000 bbls., 111 1/2 to 50000000000000000000000000000000000000 bbls., 112 1/2 to 100000000000000000000000000000000000000 bbls., 113 1/2 to 200000000000000000000000000000000000000 bbls., 114 1/2 to 500000000000000000000000000000000000000 bbls., 115 1/2 to 1000000000000000000000000000000000000000 bbls., 116 1/2 to 2000000000000000000000000000000000000000 bbls., 117 1/2 to 5000000000000000000000000000000000000000 bbls., 118 1/2 to 100 bbls., 119 1/2 to 200 bbls., 120 1/2 to 500 bbls., 121 1/2 to 1000 bbls., 122 1/2 to 2000 bbls., 123 1/2 to 5000 bbls., 124 1/2 to 100 bbls., 125 1/2 to 200 bbls., 126 1/2 to 500 bbls., 127 1/2 to 1000 bbls., 128 1/2 to 2000 bbls., 129 1/2 to 5000 bbls., 130 1/2 to 100 bbls., 131 1/2 to 200 bbls., 132 1/2 to

CURRENT METAL PRICES.

OCTOBER 25, 1893.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Common Iron:
 1/2 to 2 in. round and square... } \$ 1.80 @ 1.90
 1 to 6 in. x 1/2 to 1 in. }

Refined Iron:
 1/2 to 2 in. round and square... } \$ 1.90 @ 2.00
 1 to 4 in. x 1/2 to 1 in. }

1 to 6 in. x 1/2 and 5-16... } \$ 2.10 @ 2.20
 Rods—1/2 and 1-16 round and sq... } \$ 2.00 @ 2.10
 Bands—1 to 6 x 3-16 to No. 12... } \$ 2.20 @ 2.30

"Burden Best" Iron, base price... } \$ 3.00
 Burden's "H. B. & S." Iron,
 base price... } \$ 2.80

"Ulster"..... } \$ 3.00
 Norway Bars..... } \$ 3.75 @ 4.00
 Norway Shapes..... } \$ 4.50 @ 5.00

Merchant Steel from Store—

Open-Hearth and Bessemer Machinery,
 Toe Calk, Tire and Sleigh Shoe, base
 price in small lots..... } \$ 2 1/2
 Best Cast Steel, base price in small lots..... } \$ 8
 Best Cast Steel Machinery, base price in
 small lots..... } \$ 5

Sheet Iron from Store—

Black—

Best Refined Iron.

Nos. 14 to 20..... } \$ 3 1/4 @ 3 1/2
 21 to 24..... } \$ 3 1/4 @ 3 1/2
 25 to 28..... } \$ 3 1/4 @ 3 1/2

Common 1/2¢ less than the above.

Open Hearth Steel.

Best Soft Steel, Nos. 14 to 16..... } \$ 2 1/4 @ 2 1/2
 " " " 18 to 20..... } \$ 2 1/4 @ 2 1/2
 " " " 21 to 24..... } \$ 3 1/4 @ 3 1/2
 " " " 25 to 28..... } \$ 3 1/4 @ 3 1/2

Best Bloom Sheets, 1/4¢ extra over above prices.
 Best Bloom, Galvanized, jobbing dis. 70 @ 70 1/2
 Ordinary Bessemer, 1/4¢ @ 1/4¢ lower than
 above prices.

Russia, Plashed, &c.

Genuine Russia, according to
 assortment..... } \$ 12 @ 13
 Patent Plashed..... } \$ 14 @ 15
 Craig Polished Sheet Steel..... } \$ 18 @ 20

English Steel from Store—

Best Cast..... } \$ 15
 Extra Cast..... } \$ 16
 Swaged, Cast..... } \$ 16
 Best Double Shear..... } \$ 12
 Blister, 1st quality..... } \$ 10
 German Steel, Best..... } \$ 10

2d quality..... } \$ 9
 3d quality..... } \$ 8
 Sheet Cast Steel, 1st quality..... } \$ 15
 2d quality..... } \$ 14
 3d quality..... } \$ 12 1/2
 R. Mushet's "Special"..... } \$ 48
 " " " Annealed..... } \$ 75
 " " " "Titanic"..... } \$ 20

METALS—

Tin—

Banca, Pigs..... } \$ 22 1/2
 Straits, Pigs..... } \$ 21 1/2
 Straits in Bars..... } \$ 22 1/2

Tin Plates—

Duty: 2 1/2¢ # D.

Charcoal Plates—Bright—
 Guaranteed Plates command special prices,
 according to quality. Per box

Melny and Calland Grade, IC, 10 x 14..... } \$ 6.50
 " " " " " 12 x 12..... } \$ 6.75
 " " " " " 14 x 10..... } \$ 6.50
 " " " " " 16 x 10..... } \$ 6.50

IX, 10 x 14..... } \$ 8.50
 " " " " " 12 x 12..... } \$ 8.75
 " " " " " 14 x 10..... } \$ 8.50
 " " " " " 16 x 10..... } \$ 8.50

IX, 10 x 14..... } \$ 17.00
 " " " " " 12 x 12..... } \$ 17.00
 " " " " " 14 x 10..... } \$ 17.00
 " " " " " 16 x 10..... } \$ 17.00

DC, 12 x 17..... } \$ 6.00
 " " " " " 14 x 10..... } \$ 6.00
 " " " " " 16 x 10..... } \$ 6.25
 " " " " " 18 x 10..... } \$ 6.00

IX, 10 x 14..... } \$ 7.50
 " " " " " 12 x 12..... } \$ 7.75
 " " " " " 14 x 10..... } \$ 7.50
 " " " " " 16 x 10..... } \$ 7.50

IX, 10 x 14..... } \$ 15.00
 " " " " " 12 x 12..... } \$ 15.00
 " " " " " 14 x 10..... } \$ 15.00
 " " " " " 16 x 10..... } \$ 15.00

DC, 12 x 17..... } \$ 5.50
 " " " " " 14 x 10..... } \$ 5.50
 " " " " " 16 x 10..... } \$ 5.50
 " " " " " 18 x 10..... } \$ 5.50

Coke Plates—Bright—

Steel Coke, IC, 10 x 14, 14 x 20..... } \$ 5.50
 " " " " " 10 x 20..... } \$ 8.50
 " " " " " 20 x 28..... } \$ 11.50
 " " " " " 10 x 14, 14 x 20..... } \$ 7.00

BV Grade, IC, 10 x 14, 14 x 20..... } \$ 5.50

Charcoal Plates—Terne—

Guaranteed Plates command special prices
 according to quality.

Dean Grade, IC, 14 x 20..... } \$ 5.65
 " " " " " 20 x 28..... } \$ 11.00
 " " " " " 14 x 20..... } \$ 6.40
 " " " " " 20 x 28..... } \$ 12.80

Abecarne Grade, IC, 14 x 20..... } \$ 5.55
 " " " " " 20 x 28..... } \$ 10.75
 " " " " " 14 x 20..... } \$ 6.40
 " " " " " 20 x 28..... } \$ 12.80

Tin Boiler Plates—

IX, 14 x 28..... } \$ 13.35
 IX, 14 x 28..... } \$ 14.50
 IX, 14 x 31..... } \$ 16.00

American Terne Plates—Apollo.

IC, 14 x 20..... } \$ 6.25
 IC, 10 x 28..... } \$ 12.50
 IX, 14 x 20..... } \$ 7.25
 IX, 20 x 28..... } \$ 14.50

Duty: Pig, Bar and Ingot, 1 1/2¢; Old Copper, 1¢
 # B. Manufactured (including all articles of
 which Copper is a component of chief value),
 35¢ ad valorem.

Copper—

Lake..... } \$ 11
 Ansonia grade Arizona..... } \$ 10 1/4
 Ansonia grade Casting..... } \$ 10

Sheet and Bolt—

Prices adopted by the Association of Copper
 Manufacturers of the United States, May
 19, 1892. Subject to a discount of 15¢ @ 35¢,
 according to size of order. Stub's gauge
 standard.

Not wider than	Not longer than	And longer than	Weights per sq. foot and prices per pound.									
			Over 64 oz.	28 to 64 oz.	16 to 28 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.		
30	72	72	22	22	22	23	24	25	28	30		
30	80	72	22	22	22	23	24	25	27	31		
36	96	96	22	22	22	24	25	26	30	33		
36	96	96	22	22	22	25	26	27	31	36		
48	96	96	22	22	22	26	28	29	32			
48	96	96	22	22	22	27	29	30				
60	96	96	22	22	22	28	30					
60	96	96	22	22	22	29						
84	96	96	23	24								
84	96	96	24	25								
Over 84 in. wide			25	27								

Bolt Copper, 3/4 inch diameter and over, # D 2¢
 Circles, Segments and Pattern Sheets, 60 in.
 diameter and less, 3¢ # D advance over prices
 of Sheet Copper required to cut them from.
 Circles, Segments and Pattern Sheets, over 60
 in. diameter, up to 96 in. diameter inclusive,
 4¢ # D advance over prices of Sheet Copper
 required to cut them from.
 Circles, Segments and Pattern Sheets, over 96
 in. diameter, 5¢ # D advance over prices of
 Sheet Copper required to cut them from.
 Cold or Hard Rolled Copper 14 oz. # square foot
 and heavier, 1¢ # D over the foregoing prices.
 Cold or Hard Rolled Copper lighter than 14 oz. #
 square foot, 2¢ # D over the foregoing prices.
 All Polished Copper over 20 in. wide, 2¢ # D
 advance over the foregoing prices.

Copper Bottoms, Pits and Flats—

14 ounce to square foot and heavier..... } \$ 26
 12 ounce and up to 14 ounce to square foot..... } \$ 27
 10 ounce and up to 12 ounce..... } \$ 29
 Lighter than 10 ounce..... } \$ 32

Circles less than 8 inches diameter, 2¢ # D ad-
 ditional.

Circles over 13 inches diameter are not classed
 as Copper Bottoms.

15¢ @ 25¢ discount, according to size of order.

Copper Wash Bowl Bottoms—

Tinned..... } \$ 34¢, 15¢ @ 25¢
 Tinning—

Tinning sheets on one side, 10, 12 and 14 x 48
 each..... } \$ 8
 Tinning sheets on one side, 30 x 60 each..... } \$ 30
 For tinning boiler sizes, 9 in. (sheets 14 in. x 60
 in.), each..... } \$ 15
 For tinning boiler sizes, 8 in. (sheets 14 in. x 56
 in.), each..... } \$ 12
 For tinning boiler sizes, 7 in. (sheets 14 in. x 52
 in.), each..... } \$ 12

Tinning sheets on one side, other sizes, per
 square foot..... } \$ 2 1/2
 For tinning both sides double the above prices.

Plashed Brass and Copper—

Not larger than 30 x 60.
 16 oz. and heavier..... } \$ 24
 14 oz..... } \$ 25
 12 oz..... } \$ 27

Seamless Brass Tubes—

Standard always Stub's gauge, unless other-
 wise ordered.

July 6, 1892.

Net.

O. G. N. G. % % % % 1 1 1/2

8-14 6-12 32 28 25 24 23 22 19

15 13 23 28 26 25 24 23 20

16 14 24 29 27 26 25 24 20

17 15 25 30 28 27 26 25 21

18 16 27 31 29 27 26 25 22

19 17 28 32 30 29 28 27 24

20 18 29 33 32 31 30 29 26

21 20 31 36 34 33 32 31 29

22 21 33 37 35 34 33 32 31

23 22 35 39 37 36 35 34 34

24 23 37 41 39 38 37 36 36

25 24 39 43 41 40 39 38 40

Copper, Bronze and Gilding Tube, 3/4 # D additional
 Braided Brass Tubing. (To No. 20 inclusive.)
 Brown & Sharpe's gauge standard.

Above 5-16 inch to 3 inch, inclusive..... } \$ 35
 Plain, above 3 inch..... } \$ 45
 Plain, 5-16 inch..... } \$ 45
 Plain, 3-16 inch..... } \$ 60
 Plain, 1-16 inch..... } \$ 81.00
 Fancy Tubing, Brass, to No. 20, inclusive..... } \$ 1.50
 Bronze Tubing, 3/4 # D more than Brass.
 Discount from list..... } \$ 30 @ 1/2

Roll and Sheet Brass—

(Brown & Sharpe Standard Gauge.)

Common High Brass: In. 2 10 12 14 16 18 20 22 24

Wider than and including 10 12 14 16 18 20 22 24

To No. 20, inclusive 21 22 23 25 27 29 31 33

Nos. 21, 22, 23 and 24 22 23 24 26 28 30 32

Nos. 25 and 26 23 24 25 27 29 31 33

Nos. 27 and 28 24 25 26 28 30 32 34

Common High Brass: In. 24 26 28 30 32 34 36 38 40

To No. 20, inclusive..... } \$ 36
 Nos. 21, 22, 23 and 24..... } \$ 37
 Nos. 25 and 26..... } \$ 38
 Nos. 27 and 28..... } \$ 39

Discount from List 15¢ to 25¢.

Brass and Copper Wire—

List January 17, 1884.

Numbered by Stub's gauge. Soft & hard high brass. Spring high brass. Low brass. Copper.

All Nos. to No. 16, inclu-
 sive..... } \$ 0.22
 No. 17 and No. 18..... } \$ 0.24
 No. 19 and No. 20..... } \$ 0.26
 No. 21, or 0.032 diameter..... } \$ 0.28

Discount 15¢ to 25¢.

Fine Numbers.

Numbered by London gauge. Brass. Spring high brass. Low brass. Copper.

No. 22..... } \$ 0.26
 No. 23..... } \$ 0.28
 No. 24..... } \$ 0.30
 No. 25..... } \$ 0.32
 No. 26..... } \$ 0.34
 No. 27..... } \$ 0.36
 No. 28..... } \$ 0.38
 No. 29..... } \$ 0.40
 No. 30..... } \$ 0.42
 No. 31..... } \$ 0.44
 No. 32..... } \$ 0.46
 No. 33..... } \$ 0.48
 No. 34..... } \$ 0.50
 No. 35..... } \$ 0.52
 No. 36..... } \$ 0.54
 No. 37..... } \$ 0.56
 No. 38..... } \$ 0.58
 No. 39..... } \$ 0.60
 No. 40..... } \$ 0.62

— 1/2 discount.
 Spring Wire, 2¢ # D advance.

Copper Belt and Hose Rivets and Burrs—

No. 5..... } \$ 49¢
 No. 6..... } \$ 49¢
 No. 7..... } \$ 49¢
 No. 8..... } \$ 49¢
 No. 9..... } \$ 49¢
 No. 10..... } \$ 49¢

No. 11..... } \$ 56¢
 No. 12..... } \$ 56¢
 No. 13..... } \$ 56¢
 No. 14..... } \$ 56¢
 No. 15..... } \$ 56¢

60¢ @ 5¢ discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.
 1/2 to 3 1/2 inches inclusive..... } \$ 17¢ # D
 Over 3 1/2 to 5 inches inclusive..... } \$ 18¢ # D
 Piston Rods, Finished True, Smooth and Straight.
 1/2 to 3 1/2 inches inclusive..... } \$ 18¢ # D
 Over 3 1/2 to 5 inches inclusive..... } \$ 19¢ # D

Spelter—

Duty: Pig, Bars and Plates, \$1.50 # 100 lb.
 Western Spelter..... } \$ 4 1/2 @ 4 3/4
 Bertha (pure)..... } \$ 8 @ 8 1/4

Zinc—

Duty: Sheet, 2 1/2¢ # D.
 600 lb casks..... } \$ 54¢ @ 56¢
 Per lb..... } \$ 6 1/2

Lead—

Duty: Pig, \$2 # 100 lb. Old Lead, 2¢ # D. Pipe
 and Sheets, 2 1/2¢ # D.
 American Pig..... } \$ 4 1/2 @ 4 10
 Bar, subject to discount 20%..... } \$ 4 1/2
 Pipe, subject to discount 20%..... } \$ 15
 Tin-Lined Pipe, subject to discount 20%..... } \$ 37 1/2
 Block Tin Pipe, subject to discount 20%..... } \$ 7
 Sheet, subject to discount 20%..... } \$ 7
 Old Lead in exchange, 3 1/4¢ # D.

Solder—

1/2 @ 1/4 (Guaranteed)..... } \$ 13¢ @ 14¢
 No. 1..... } \$ 11 1/2 @ 12 1/2
 Prices of Solder indicated by private brands
 vary according to composition.

Antimony—

Cookson..... } \$ 11
 Hallett's..... } \$ 10 1/2

Aluminum—

Duty: 15¢ # D.
 No. 2 grade metal, in toa lots..... } \$ 75
 No. 1 (guaranteed to be 98% pure and over), in ton
 lots..... } \$ 90
 Lots less than 1 ton..... } \$ 10¢ # D additional

Old Metals—

Prices Paid in New York.

Heavy Copper..... } \$ 7 1/2
 Light and Tinned Copper..... } \$ 6 1/2
 Heavy Brass..... } \$ 6 1/2
 Light Brass..... } \$ 6 1/2
 Lead..... } \$ 2
 Tea Lead..... } \$ 2
 Zinc..... } \$ 23 1/2
 No. 1 Pewter..... } \$ 14
 No. 2 Pewter..... } \$ 7
 Wrought Scrap Iron..... } \$ 10.00
 Heavy Cast Scrap..... } \$ 8.00
 Stove Plate Scrap..... } \$ 5.00
 Burnt Iron..... } \$ 3.00

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